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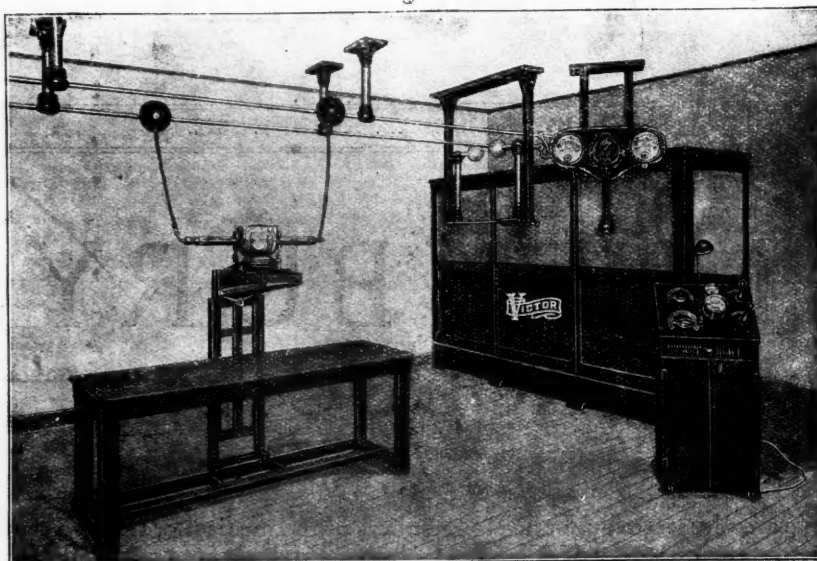
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THE COMPLEMENT FIXATION TEST FOR HYDATID DISEASE AND ITS CLINICAL VALUE.¹

By N. HAMILTON FAIRLEY, O.B.E., M.D., M.R.C.P., D.T.M. & H.,

From the Walter and Eliza Hall Institute for Research, Melbourne.

GHEIDINI (1907)⁽¹⁾ first applied the principles of the Bordet-Gengou method of serological diagnosis to three cases of hepatic hydatid and also investigated ancylostome and ascaris infestations. Weinberg (1909)⁽²⁾ investigated in some detail the value of the serological reaction in human echinococcosis and published several papers on various aspects of this subject. Weinberg's article in Kolle and Wassermann's "System" (1913)⁽³⁾ gives the most complete account of the serological reaction at present available and includes statistics by different observers collected between 1906 and 1912 and comprising a series of three hundred and six cases. Of these, two hundred and fifty-one were positive (82%), eight were slightly positive and forty-seven were negative. Weinberg, in his total of sixty cases,

obtained forty-six positive results (76.6%), while two others were slightly positive and twelve were negative. Zapelloni (1915)⁽⁴⁾ found the results quite reliable in his clinic, 93% of positive reactions having been obtained in a collected series of five hundred cases. Controls were always negative.

The Basis of the Reaction.

The complement fixation reaction in echinococcosis is an absolutely specific test dependent on the presence of specific antibody in the blood or body fluids of patients who have been absorbing hydatid antigen derived from the cyst or cysts of *Tenia echinococcus*.

The Writer's Technique.

During the past eighteen months I have found the following modification of complement fixation technique of special value in hydatid cases. For purposes of economy of materials, small volumes of reagents are measured by Donald's dropping pipettes. Each unit volume of reagent equals 0.1 cubic centimetre and the total volume in the final stage of the reaction is 0.5 cubic centimetre. Instead of varying the dilution of serum, as advocated by Weinberg, its volume and concentration are kept constant, while the number of units of complement are varied.

Antigen.

After a considerable experience with different extracts I have come to the conclusion that the most

¹ Read on behalf of Dr. Fairley by Dr. S. W. Patterson at a meeting of the Victorian Branch of the British Medical Association on February 1, 1922. An account of this work, containing full details of the experiments with various antigens and full clinical histories of the cases, has been sent to the editor of the *Quarterly Journal of Medicine*.

readily available and effective antigen consists of hydatid fluid containing scolices collected under sterile conditions from the liver or lung cysts of sheep. The livers and lungs of infested sheep are brought direct from the abattoirs to the laboratory, the wall of the cyst is painted with pure carbolic acid and a sterile needle with an attached record syringe (ten cubic centimetres) is inserted. The fluid containing scolices is aspirated and stored on ice in sterile test-tubes until required. Before use the fluid is run through a filter paper, the filtrate being employed as antigen. It is advisable not to subject the fluid to any unnecessary manipulation nor to add antiseptic, such as carbolic acid, nor to pass it through a filter candle. Such a fluid, provided it is uncontaminated by bacteria and is kept on ice, will preserve its antigenic properties for many weeks. The only other antigen which I have found to yield satisfactory results, is prepared by making a saline or alcoholic extract of well-washed scolices. It is not improbable that such extracts will become the standard antigens for future serological work in echinococcosis.

Sheep's Corpuscles.

A fresh specimen of 3% sheep's corpuscles is always prepared. The blood is obtained from sheep especially kept for this purpose and after citration (2% sodium citrate in saline solution) the corpuscles are washed with saline solution by repeated centrifugalization. The corpuscular suspension is sensitized by adding four minimum hæmolytic doses of anti-sheep hæmolysin and incubating at 37° C. for half an hour. The mixture is then kept in the ice-chest until required.

Blood from the Patient.

Blood is obtained by venous puncture. It is preferred fresh, but, provided the specimen is kept on ice and is uncontaminated, satisfactory results are obtained over a period of one week or longer. On the day of the test the serum is diluted with four times its volume of saline solution (0.85%) and heated to 55.5° C. for twenty minutes. Complement and any thermolabile anti-complementary substances in the serum are thereby destroyed. Any specimen exhibiting anti-complementary tendency in the serum control tube (fourth row) or any serum in which microbial contamination is suspected, should be discarded and a fresh specimen examined at a later date.

Pleural and peritoneal exudates or effusions should be similarly treated. If cerebro-spinal fluid is to be tested, it should neither be heated nor diluted, one volume of the pure fluid being used in the reaction.

Complement.

This is obtained from the sera of healthy male guinea-pigs. The serum is allowed to stand in contact with clot for four hours before use. It is then pipetted off and stored on ice till required.

Preliminary Tests.

As a routine procedure the minimum hæmolytic dose of complement is accurately determined when-

ever the test is performed. In the final test three, four and one-half and six minimum hæmolytic doses are employed.

It is important to note that guinea-pig's serum is never hyper-sensitive to clear, odourless hydatid fluid. In a large series of routine observations I have never observed such a fluid displaying anti-complementary tendency. In equal volumes, clear hydatid fluid actually fixes less complement than physiological saline solution, yet it never shows hæmolytic tendency. Schilling (1904)⁽⁵⁾ showed that cyst fluid was isotonic with the blood of the host. In view of these findings, I no longer regard the titration of this antigen as necessary in routine tests. On the other hand, turbid hydatid fluids are often anti-complementary and should never be used. The turbidity may be dependent on degenerative changes in the cyst or on microbial contamination.

The titre of anti-sheep hæmolysin needs only be determined at three-monthly intervals. Provided it is stored on ice, there is little depreciation in titre during the first nine months.

Arrangement of the System for the Final Test.

Racks containing four rows of tubes are utilized and the various reagents are added as indicated in Table I. The quantity of undiluted hydatid fluid employed was 0.1 cubic centimetre, but recently I have increased this amount to 0.15 cubic centimetre. However, as sufficient time has not elapsed to estimate the validity of this procedure, the original quantity is advocated for routine work.

TABLE I.—ARRANGEMENTS OF REAGENTS IN THE FINAL TEST.

Reagents.	Row I.	Row II.	Row III.	Row IV.
1. Antigen (pure hydatid fluid)	0.1 c.c.m.	0.10 c.c.m.	0.1 c.c.m.	—
2. Patient's Serum (diluted 1 in 5) . . .	0.1 c.c.m.	0.10 c.c.m.	0.1 c.c.m.	0.1 c.c.m.
3. Complement (0.1 c.c.m. = three minimum hæmolytic doses) . .	0.1 c.c.m.	0.15 c.c.m.	0.2 c.c.m.	0.1 c.c.m.
4. Saline Solution (0.85%)	0.1 c.c.m.	0.05 c.c.m.	—	0.2 c.c.m.

These reagents are placed in the incubator for one hour at 37° C. and then one volume (*i.e.*, 0.1 cubic centimetre) of sensitized sheep's cells is added. The total volume in each tube is then 0.5 cubic centimetre.

Controls are always employed. Several non-reacting sera and a known reacting hydatid serum are included in the series of blood to be tested. Row IV. serves to detect any anti-complementary tendency in each serum under examination.

In addition, a complement control (*i.e.*, a tube containing 0.1 cubic centimetre of complement and 0.3 cubic centimetre of saline solution) and an antigen control (*i.e.*, a tube containing 0.2 cubic centimetre of antigen, 0.1 cubic centimetre of complement

and 0.1 cubic centimetre of saline solution) are set up.

Readings are made when all the special controls, including the control non-reacting sera, have hemolysed, provided Row IV. is clear. Generally the final readings are made within thirty minutes of the addition of the sensitized corpuscles.

In the interpretation of results five types of reaction are noted. A "P +++" reaction means an absence of hemolysis in tubes of Rows I., II. and III. and indicates that at least six minimum hemolytic doses of complement have been fixed by the patient's serum. A "P ++" reaction means that there is no hemolysis in tubes of Rows I. and II. and demonstrates that four and a half units of complement were absorbed. A "P +" reaction indicates an absence of hemolysis in the tube of Row I. with the fixation of three units of complement.

All these positive types of reaction are to be regarded as definitely diagnostic of active echinococcal infestation in the host. Where the first tube in Row I. shows partial hemolysis only, the reaction is re-investigated at a subsequent date ("P ±").

Complete hemolysis in all three tubes constitutes a "negative" result and though such a finding does not exclude the possibility of hydatid, it demands a careful revision of the clinical features of the case where hydatid has been provisionally diagnosed.

Hydatid Antigens.

A considerable amount of work has been carried out to determine the antigenic value of different fluids and extracts of hydatid material. Clear, uncontaminated hydatid fluid containing scolices obtained from the cysts of sheep constitutes a most reliable antigen for serological work. The fluids from either the lung or liver cysts of sheep have proved equally satisfactory as antigens in my hands. Hydatid fluid from human cysts, however, does not constitute as satisfactory an antigen as that obtained from sheep, though if both are available the two antigens may be employed with benefit (see Table II.). It is not advisable to subject the fluid to filtration or to add antiseptic. Both precautions are unnecessary, as uncontaminated fluid preserves its antigenic properties for many weeks if stored in dark glass receptacles in the ice-chest.

TABLE II.—A COMPARISON OF THE SEROLOGICAL RESULTS OBTAINED WITH HUMAN AND SHEEP HYDATID FLUID.

Antigen.	Total Cases Exam'd	Total Cases Giving Reactions.	Type of Reaction.		
			"P +++"	"P ++"	"P +"
Human . . .	55	49	28	5	16
Sheep . . .	55	50	36	3	11

In this series, two sera of patients with hydatids which did not react to sheep's fluid, yielded a reaction ("P +") with antigen derived from human sources, while three sera which failed to react with human fluid, yielded a reaction with that from

sheep. In this series the actual superiority of hydatid fluid derived from sheep, when compared with human fluid, is shown rather in the intensity of the reaction than in the increase in the number of cases diagnosed. Note the greater frequency of strongly positive reactions ("P +++") with sheep's fluid.

In further investigations it was found that saline and alcoholic extracts of mother endocyst and of daughter and grand-daughter cysts are devoid of antigenic properties. On the other hand, both saline and alcoholic extracts of scolices yield highly potent antigens. These alcoholic extracts may enable a stable concentrated antigen to be manufactured for general use.

TABLE III.—A COMPARISON OF THE ANTIGENIC VALUE OF SCOLEX EXTRACT AND ORDINARY HYDATID FLUID.

Antigen.	Total Examined.	Total Reactions.	Type of Reaction.		
			"P +++"	"P ++"	"P +"
Hydatid Fluid (sheep) . .	18	17	5	4	8
Scolex Extract (sheep) . .	18	17	10	3	4

Sixteen out of eighteen sera reacted to both antigens, but one was strongly positive ("P +++") to hydatid fluid and failed to react to scolex extract, while another serum failed to react with the former and reacted ("P +") with the latter. The serum of twenty-one other patients not manifesting the clinical signs of hydatid disease, did not react with either the scolex extract or hydatid fluid antigens. It is noteworthy that four of these patients were syphilitic.

Hydatid fluid in the amounts employed in these tests and experiments never acted as a syphilitic antigen. On the other hand, saline and alcoholic extracts of the cyst contents (endocyst, daughter cysts and scolices) may act as weak syphilitic antigens if used in too concentrated solution. Careful standardization and appropriate dilution enable the serologist to work outside the danger zone of pseudo-positive reactions yielded by syphilitic sera.

Factors Modifying the Complement-Fixation Reaction in Hydatid Diseases.

A certain minority of hydatid infestations yield sera which do not give complement fixation reactions. The causes underlying the non-appearance of antibody are due either to a deficiency in the antigenic properties of the parasitic fluid or lack of absorption of hydatid antigen through the adventitia. Rarely, where severe intercurrent diseases co-exist, its absence may be traceable to a complete failure of the immunizing mechanism resulting from the poisoning of the tissue cells elaborating antibody. Certain complications of echinococcosis, such as partial or complete rupture of the cyst and supuration, lead to a transient increase in the anti-

body content of the blood. Operative intervention when the cyst is drained produces a similar result.

TABLE IV.—THE RELATIONSHIP BETWEEN THE SEROLOGICAL REACTION AND THE CONDITION OF THE CYST.

Condition of Cyst.	Number Examined.	Number of Reactions.	Percentage of Reactions.
Uncomplicated	45	34	75.6
Recent Rupture (incomplete) . .	12	11	91.7
Recent Suppuration	17	17	100.0

Note the greater percentage of positive reactions where these complications have supervened than in uncomplicated cases.

On the other hand, chronic suppuration producing death of the parasite and chronic abscess formation, complete rupture with evacuation of the cyst contents and degeneration of the parasite, all lead to the disappearance of antibody from the blood of the host.

TABLE V.—THE RELATION BETWEEN THE SEROLOGICAL REACTION AND DEATH OF THE PARASITE.

Condition of Cyst.	Number Examined.	Number of Reactions.	Percentage of Reactions.
Chronic Suppuration	2	0	0
Old Rupture (complete)	3	0	0
Degeneration of Parasite	11 ¹	0	0

The Value of this Complement Fixation Reaction in Clinical Medicine.

An analysis of a large series of routine serological tests will now be recorded. During the past eighteen months 1,070 cases have been investigated by means of this serological reaction. Of the patients, 153 were suffering from or had at some previous date been infested with hydatid disease. In 917 cases in which there was no evidence of echinococcosis, no serological reaction was obtained. In not a single instance was a misleading positive serological diagnosis made. In a number of cases of intra-abdominal tumours, including ovarian, omental and pseudo-pancreatic cysts, the validity of the negative result was upheld at operation, where previously a definite diagnosis of hydatid had been made on clinical grounds. Eight cases of other helminthic diseases were definitely negative. Four were cases of bilharziosis (*Bilharzia hæmatobium*), two of infestation with *Ascaris lumbricoides*, one each of infestation with *Oxyuris vermicularis* and *Tænia saginata*. No tendency to pseudo-positive reaction was noted, thus supporting the observations of Thompson and Magnusson⁽⁶⁾ on the specificity of the reaction. Sera from 135 persons with syphilis yielding strongly positive Wassermann reactions gave no

¹ Six of these cysts were found at operation and five were demonstrated at autopsy in patients who died of intercurrent diseases.

pseudo-positive reactions with the hydatid complement fixation test with the writer's technique already described. Other sera examined were derived from persons suffering from almost every disease met with in hospital practice and included pulmonary and hepatic lesions of every description, hæmatoma, abscess, tumours, malignant disease, abdominal cysts, acute abdominal conditions and even systemic infections. Out of 774 cases examined, negative serological results were consistently obtained and pseudo-positive reactions were never met with. Perhaps the most remarkable feature of this important reaction is its absolute specificity. Non-hydatid sera hemolyse with such rapidity and certainty that no doubt remains in the mind of the serologist regarding the "negative" nature of the reaction.

The Diagnostic Value of the Reaction in Hydatid Disease.

A total of one hundred and fifty-three cases of echinococcosis was examined. Frequently, repeated tests were made on the same person. The patients were either suffering from active cysts, from dead hydatids or at some previous time had been more or less successfully operated on for this condition. In the latter group, the blood was sent for re-investigation.

A.—Serological Examination of Persons Infested with Living Hydatid at the Time of or Previous to Surgical Intervention.

In a preceding section the results obtained in a series of dead degenerated cysts and the modifying influence of certain complications, such as suppuration and rupture, were considered in detail and will receive no further comment in this section.

The general results obtained regarding pre-operative diagnosis in eighty-three cases of hydatid disease are incorporated in the following table:

TABLE VI.—THE VALUE OF THE COMPLEMENT FIXATION TEST IN PRE-OPERATIVE DIAGNOSIS.

Total Cases Examined.	Number of Reactions.	Type of Reaction.			Percentage of Reactions.
		"P +++"	"P ++"	"P +"	
83	70	50	8	12	84.3

A few sera included in this series were examined for the first time at or within three days of operation. In the remainder the blood was collected prior to surgical interference. For the first three days following operation the antibody content of the blood shows no increase; sometimes it is actually decreased. For this reason sera examined within this period can quite legitimately be included when assessing the value of the reaction in pre-operative diagnosis.

The high incidence of positive serological diagnosis (84.3%) in the above series conclusively proves the great value of the reaction in medicine. In thirty-one cases the clinical diagnosis had been

definitely hydatid, but in the remainder it was doubtful or echinococcosis had not been suspected. On the other hand, seventy out of the eighty-three cases were rightly diagnosed by the complement fixation reaction. I am convinced that the routine adoption of this test in medical practice would double the efficiency of clinical diagnosis in this disease and considerably lower the operative mortality.

During the past ten years there has been no decrease in the yearly incidence of patients with hydatid disease admitted to the Melbourne Hospital. According to figures obtained by Dr. K. D. Fairley, the Medical Registrar of the Hospital, in analysing the in-patient admissions for the last decade, out of 182 patients suffering from echinococcal cysts, the case histories indicated that in only eighty-four, *i.e.*, 40.7%, had a correct diagnosis been made prior to operation. These figures, which comprise the only large Australian series available since the introduction of routine X-ray examination, forcibly illustrate the limitations of clinical diagnosis if unaided by modern laboratory investigations.

B.—Effect of the Age of the Host and the Situation of the Cyst on the Complement Fixation Reaction.

TABLE VII.—THE AGE FACTOR AND THE COMPLEMENT FIXATION REACTION.

Decade.	Number Examined.	Number of Reactions.	Percentage of Reactions.
1-10 ¹	11	7	63.6
11-20	7	4	57.1
21-30	16	15	93.7
31-40	14	12	85.7
41-50	13	11	84.6
51-60	12	11	91.6
61-90	4	4	100
Total	77	64	83.1

It will be seen that the most unsatisfactory results were obtained during the first two decades of life. In investigating cases of echinococcosis at the Children's Hospital, Melbourne, negative serological results were frequently obtained in definite cases of hydatid. Such a result was difficult to explain, as the fluid from hydatids in children almost always contains scolices and is antigenic. Further, in all the cases investigated post-operative complement fixation reactions have developed. Examination of the adventitia shows it generally to be less fibrosed than that of the adult. What, then, is the explanation of the anomaly? In Table IV. it was shown that uncomplicated cysts were responsible for more failures to react than those in which suppuration or rupture had occurred. It would appear that the younger the host, the less the chances of such complications. This may afford the explanation of the lower percentage of positive reactions observed during the first two decades of life.

C.—Observations Relating to the Anatomical Situation of the Parasite Did Not Suggest that this Factor Materially Affected the Reaction.

TABLE VIII.—THE SITE OF THE PARASITE AND THE COMPLEMENT FIXATION REACTION.

Situation.	Number Examined.	Number of Reactions.	Percentage of Reactions.
1. Multiple	8	8	100
2. Liver ¹	40	34	85
3. Lung	19	17	89.5
4. Peritoneum and Pelvis .. .	10	8	80
5. Spleen	1	1	100
6. Muscle and Bone	4	2	50
7. Thyroid	1	0	0
Totals	83	70	84.3

It is of interest to note that of the eighty-three patients under review, thirty-five gave a history of previous operation for hydatid and of these thirty-two, or 91.4%, yielded the reaction. Of the other forty-eight persons operated on for the first time, thirty-eight, or 79.2%, gave reactions.

The Significance of Persistent Serological Reactions After Operation on Hydatid Cysts.

The absorption of hydatid antigen at operation or during subsequent drainage of the cyst leads to a marked and early rise in the antibody content of the blood, followed in a period of fourteen to twenty-one days by a fall to a lower level. Subsequently the reaction may persist or entirely disappear. The significance of the modification of the post-operative curves and the exact time at which antibody may be expected to disappear in the event of effective operative intervention, need careful study. Echinococcosis more often than not is a multiple infestation and in consequence the question whether other cysts remain after operative intervention is of great practical importance to the surgeon and patient alike. For eighteen months I have been collecting data on this question and propose to classify the findings according to the duration of time elapsing between the operation and the type of serological result obtained.

A.—The Type of Reactions Observed Within Twelve Months of Operation.

TABLE IX.—THE COMPLEMENT FIXATION REACTION IN PATIENTS OPERATED ON NOT MORE THAN TWELVE MONTHS PREVIOUSLY.

Time Elapsing Since Operation.	Number of Cases Examined.	Number of Reactions.	Number of Sera Not Reacting.
1-4 weeks	32	30	2
2-3 months	17	17	0
4-6 months	16	10	6
7-9 months	8	6	2
10-12 months	8	5	3

Note.—Four of these patients giving persistent positive reactions have proved at subsequent operations to have hydatid.

¹ The youngest child of the series was aged two and a half years and suffered from a suppurative hydatid of the liver.

¹ In ten of the liver cases and four of the pulmonary ones the location of the cyst was determined on clinical grounds. In all other cases their situation was demonstrated at autopsy or operation.

During the first three months forty-seven out of forty-nine sera yielded reactions, whereas during the subsequent nine months only twenty-one reactions were recorded out of thirty-two investigations. Antibody had disappeared from the blood of eleven patients.

I regard the presence of a "P +++" reaction as absolutely diagnostic of another cyst when such a reaction is persistent twelve months after operation. Subsequent investigation may reduce the time factor to six months or less, but proof of this has not yet been established. More work is required over a longer period of time before this important question can be regarded as settled. From the surgical point of view a post-operative positive reaction ("P +++") of more than twelve months' duration may be regarded as diagnostic of a living cyst and, provided there are reasonable grounds for suspecting its anatomical location, laparotomy is indicated. In cases in which serum which had yielded a reaction lost this power within a few months of operation and the power did not reappear, and in the absence of clinical evidence of cysts elsewhere, the chance of persistent infestation is remote. Such findings enable the surgeon to give an optimistic prognosis regarding the chance of recurrent echinococcosis.

B.—The Significance of the Response to the Test in Patients Who Have Been Operated on More Than Twelve Months Previously.

While the exact significance of persistent reactions during the first twelve months of operation is not always obvious, yet the data I have collected in Table X. can leave little doubt as to their meaning after that time.

TABLE X.—THE COMPLEMENT FIXATION REACTION AS AN INDEX TO RECURRENT ECHINOCOCCOSIS AT PERIODS GREATER THAN ONE YEAR AFTER OPERATION.

Time Elapsing After Operation.	Number of Cases Investigated.	Number of Reactions.	Clinical Cases of Hydatid.
1-2 years	17	9	4
2-3 years	10	6	5
3-4 years	6	1	1
4-5 years	3	2	1
5-6 years	4	3	3
7-12 years	12	8	7
12-18 years	2	2	2
18-24 years	4	1	1
24-48 years	4	1	1
Unclassified (several years)	7	7	7
Totals	69	40	32

It will be noted that out of sixty-nine cases in patients who at some period or other had been operated on for hydatid, forty yielded positive serological reactions. In thirty-two of these it was actually possible to prove the presence of hydatid infestation. With the remaining eight patients one can confidently assume that latent echinococcosis is

present and that the subsequent history—if followed through—will confirm the serological diagnosis.

Summary.

A satisfactory technique for the complement fixation test for hydatid is described and its clinical value estimated in observations of 153 cases of hydatid disease.

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THE RESULTS OF AN ANALYSIS OF THIRTY-THREE CASES OF HYDATID DISEASE OF THE LUNG.*

By K. DOUGLAS FAIRLEY, M.B., B.S.,
Medical Registrar, Melbourne Hospital.

Introduction.

In the last twelve years, thirty-three patients with hydatid disease of the lung have been admitted to the wards of the Melbourne Hospital. In each of these cases, the diagnosis has been confirmed by the surgeon at operation or by the pathologist. This paper comprises the results of an analysis of the case histories of these patients.

Age and Sex Incidence.

Males were affected about twice as frequently as females, while the ages of the patients were fairly evenly distributed over the various decades, as shown in Table I.:

TABLE I.—AGE AND SEX INCIDENCE.

Age.	Male.	Female.	Total.
15-20	1	1	2
21-30	5	1	6
31-40	5	4	9
41-50	5	2	7
51-60	5	2	7
61-70	2	0	2
Total	23	10	33

Pathology.

The adult worm, *Tenia echinococcus*, is one of the smallest of the tapeworms, being less than five millimetres long.

In the cystic stage of its development, however, when it is known as hydatid, it may attain dimensions greater than those of any other larval cestode.

Modern opinion definitely tends towards the view

* Read at a meeting of the Victorian Branch of the British Medical Association on February 1, 1922.

that the *Echinococcus hydatidosus* is specifically different from the *Echinococcus alveolaris* of Central Europe.

The Life Cycle of the Parasite.

The adult worm, which is usually found in the upper half of the small intestine of the dog, consists of a head and three proglottides, only the last of which is mature.

This terminal segment, which probably contains several hundred eggs, breaks off and is passed in the feces, the ova being liberated as the soft tissues decay. Thus these ova, covered with a resistant chitinous capsule, are scattered over the soil and swept away in the surface waters. Thence the embryo, by way of contaminated water, vegetables, grasses or perhaps from direct contact with pet dogs, reaches the alimentary canal of the intermediate host, usually either sheep, cattle, swine or man.

The protective envelope is dissolved by the digestive juices of the host, setting free the embryo, which eventually reaches the various parts of the body and, having at last come to rest, loses its spines and forms a solid mass of cells with coarsely granular contents surrounded by the elastic ectocyst.

Later fluid accumulates in the interior of this mass and so the cyst develops. The laminated ectocyst and the granular endocyst become more marked, while the fibrous tissue capsule derived from the host appears.

From the endocyst, even at a very early stage in the growth of the parasite, brood capsules and scolices arise. The exact details of their development are not definitely known.

In man, daughter and grand-daughter cysts are usually formed by endogenous budding from the endocyst, but frequently in hydatids of the brain and always in hydatids of the bone the process is one of exogenous proliferation.

The rate of growth in both adult and cystic stages of *Tania echinococcus* is relatively slow as compared with that of other cestodes, e.g., in man the parasite may remain for as long as twenty years in an apparently healthy state.

Ultimately the intermediate host dies, when, if the carcass be consumed by the definitive host, the scolices are liberated in the alimentary canal and in from four to eight weeks reach the adult stage; thus the life cycle is again renewed.

Multiple Infestation.

In hydatid disease, multiple cysts are frequently found. There may be several in one organ or they may be scattered throughout the various parts of the body. In 39.4% of these thirty-three patients there was evidence of multiple infestation at operation, *post mortem* or on clinical examination. This figure is probably too low, as it is often difficult to determine the presence of latent hydatid disease. How often in the *post mortem* room do we discover cysts which gave no indication of their presence during life? A cyst may become very large without causing any trouble, though usually in pulmonary infestations the slowly growing parasite gives rise to mild symptoms of which the patient takes little

notice for some months before medical advice is sought.

Position of Cyst.

In four of these cases the cyst was situated in the left lung; in two it was at the apex of the right lung. The affected site in the remaining twenty-seven was the lower portion of the right lung.

The Path Traversed by the Embryo.

Other observers have also noted that the lower lobe of the right lung is the most frequent site of pulmonary hydatid infestation. This remarkable distribution of the cysts cannot be explained by any theory which involves the passive migration of the embryo to the lung by the blood stream. Such a mode of conveyance would result in a much more even sowing of the cysts in the various parts of both right and left lungs.

It is usually stated that the embryo reaches the liver from the alimentary canal by the portal circulation and from there passes to the lungs by the blood stream. It has also been suggested that the parasite may avoid the capillary bed of the liver and go direct to the lung by boring either through the oesophageal wall into blood vessels which empty into the superior *vena cava* or through the rectal wall into branches of the inferior hæmorrhoidal veins, so reaching the inferior *vena cava* and thence through the right auricle to the lungs. It is improbable that the embryo is conveyed to the lung by the blood stream in any but occasional cases, e.g., perhaps when the cyst is found at the apex of the lung.

The rarity of hydatid infestation of the lymphatic system, both glands and vessels, is evidence against its transmission by the lymphatics.

The remaining method by which the embryo may reach the lungs is active migration.

Stirling and Verco⁽¹⁾ have pointed out that various organisms allied to *Tania echinococcus* show a selective affinity for particular regions of the body, e.g., *Cysticercus cellulosa* for the brain and muscles of man and the larval stage of *Tania cœnurus* for the brain of sheep. Similarly, the hydatid cyst shows a selective affinity for the various viscera, especially the liver and lung.

The liver may be reached either by active migration of the parasite or passively by the portal blood stream. Leuckart found the organism in the portal vessels and it seems quite probable that the embryo usually reaches the liver passively by the portal circulation.

The right lobe of the liver is the part most frequently affected and from here by active migration the parasite would quickly reach the lower lobe of the right lung, where it is so often found.

This would seem to be the usual route adopted by the embryo to reach the lungs.

Dr. H. Boyd Graham found that in a series of 118 hydatid cysts in children, pulmonary cysts comprised 30.5% of the total number. The usual percentage of cases of pulmonary cysts in adults is from 10% to 15% and this series of thirty-three cases comprises 13% of the total admission to this

hospitals of patients with hydatid disease during the past twelve years.

When we consider the distance the embryo has to travel to make its way from within the liver through the diaphragm to the lung in the adult, it is easy to understand that the little parasite in many cases may cease its laborious journey before reaching the lung. In children the organs are smaller and the distance the embryo has to travel from liver to lung is decidedly less than in the adult; a larger proportion of the parasites, therefore, reach the lung before they come to rest. This is certainly a possible explanation of the greater frequency of pulmonary hydatid cysts in children.

It has been suggested that pulmonary infestation may result from inhalation of ova, but no proof of this has been forthcoming and the only recognized mode of entry of the parasite is by way of the alimentary canal.

The Condition of the Cyst.

In nine patients in the series the cyst was suppurating, while it had ruptured in thirteen patients. In five of these ruptured cysts there was evidence of secondary infection, while in two the cyst had undergone degeneration.

In only nine instances (27.3%) was the condition diagnosed before the onset of any complication.

The cyst wall also showed retrogressive changes in two other patients. Degeneration was, therefore, present in four (12.1%). It is usually stated that retrogression is a rare complication in pulmonary hydatid cysts.

In four of the five patients who dated their symptoms from a previous attack of pneumonia, secondary infection of the cyst was present, while no such unusual incidence of super-added infection was noted in patients with a previous history of pleurisy.

Frequently there is difficulty in tracing the path by which the bacterial invasion has occurred in suppurating hydatid cysts, whether of the lung or elsewhere. Perhaps from local septic foci or from the bowel periodic invasions of the blood stream by micro-organisms occur. Under normal conditions little trouble ensues, but when an area of lowered resistance is present (such as a hydatid cyst which may have been subjected to trauma or one undergoing spontaneous degeneration) the micro-organisms may attack the cyst, leading first to a pericystitis and later to suppuration within the cyst itself.

It is doubtful whether suppuration can occur in a living cyst or whether the first step in the process is the death of the parasite.

Of course, once a pulmonary hydatid has ruptured, secondary infection by the organisms present in the respiratory tract may follow.

Occasionally suppuration may be due to the irritation caused by chemical changes in the cyst, such as those resulting from the entry of bile or from the products of disintegration of a dead or dying cyst. It is often difficult to isolate any organism from the pus, though here in the more chronic cases the organisms may die out as time goes on, just as do the gonococci in tubal infections.

The Symptomatology of Pulmonary Hydatid Disease.

The onset of the disease is insidious. Often it is latent until the addition of some serious complication gives a false appearance of an acute onset to the disease.

Sometimes a previous acute respiratory infection is the starting point of symptoms which continue until the cyst is effectively treated. This was so in 33.3% of the patients in this series. In five instances the acute infection had been pneumonia, while pleurisy in five and so-called influenza in one other patient had led to a similarly persistent train of symptoms. Stirling and Verco⁽²⁾ state that pneumonia "is almost certainly only an accidental complication" of the hydatid disease. It seems probable that the compressed lung adjacent to the parasite will be in a state of lowered resistance and so pre-disposed to any infection. However this may be, the convalescence from the pneumonia is often protracted and symptoms remain until the hydatid cyst is drained. Such cysts are frequently found to be secondarily infected with micro-organisms.

When a patient has persistent symptoms dating from an acute respiratory infection some months before, the possibility of hydatid disease of the lung being present should never be forgotten.

Within the past few days in the wards the importance of this rule has been demonstrated. A female patient, aged twenty-two years, was admitted with the diagnosis of pulmonary tuberculosis and on examination the signs were found to be those of a huge pleural effusion in the left side of the chest. The skiagraphist reported a possible large pleural effusion. The house surgeon proposed to aspirate the fluid, but it was thought advisable to await the result of a complement fixation test of the blood for hydatid, as the similarity of this girl's history to that given by the five patients in this series who dated their symptoms from an attack of pneumonia, had impressed itself upon me.

The history of this patient (whose condition was diagnosed too late to be included in this series) is as follows:

Until five months before admission she had been quite well. About this time she noticed that she became breathless and tired with much less exertion than formerly. Three months before she was confined to her bed for four weeks with an attack of pneumonia, since when she had been languid, easily tired and generally "off colour," while a severe cough, worse at night, had been constantly present.

In the three weeks prior to admission she had vomited frequently, on one occasion bringing up about a cupful of bright blood (? hæmoptysis). She had lost over three and a half kilograms in weight and had suffered from night sweats.

For the past fortnight she had been in bed, while severe pleuritic pain had been present in the left side of the chest for a few days before admission to hospital. Lately her breathlessness had increased, though she was quite comfortable while resting.

The heart was displaced slightly to the right. The cardiac dullness extended one finger's breadth to the right, while the apex beat was in the fifth space, 6.3 centimetres from the mid-line.

The left side of the chest showed some flattening, particularly over the lower ribs, while the lower ribs on the right side by comparison seemed to bulge forwards. There was diminished respiratory excursion all over the left side of the chest.

Absolute dullness, with a marked sense of resistance, was present all over the left side of the chest anteriorly and

below the inferior angle of the scapula posteriorly. Resonance was impaired over the upper portion of the left half of the chest posteriorly. Over the absolutely dull area the breath sounds, vocal fremitus and vocal resonance were markedly diminished and practically absent, while over the left upper segment of the chest the breath sounds were diminished and expiration was prolonged, breathing being distant bronchial in type. No adventitia were present.

The liver was apparently normal.

The skiagram revealed that the left half of the chest was irregularly dull. The heart was displaced. The radiographer suggested that there might be a large pleural effusion.

The sputum was muco-purulent and yellow, with an occasional pink tinge; on six occasions it was examined for tubercle bacilli, but none was found.

The temperature was intermittent, reaching to 38.9° C. during the two weeks after admission to hospital. The pulse and respiration rates were correspondingly raised.

The leucocyte count showed 4.6% of eosinophile cells in a total count of 20,000 per cubic millimetre.

A few somewhat soft, slightly enlarged glands were found in the left axilla and the diagnosis of malignant disease of the lung was suggested. These glands, however, were definitely tender and were probably secondary to the suppurating pulmonary cyst.

The result of the complement fixation test for hydatid applied to the blood was "P ++." A fortnight after admission the suppurating cyst ruptured; over half of a litre of fluid containing membrane and cysts with some blood and pus was expectorated. For the last five days following the rupture of the cyst the temperature was normal.

The duration of symptoms in this series of thirty-three cases varied from one week to five years. A low average of the time interval from the onset of first symptoms until suitable treatment was instituted was nine months. Usually symptoms insufficient to cause much inconvenience were present for some months before medical advice was sought, or at least before a correct diagnosis was made.

The initial symptom was usually cough or pain, often of the pleuritic type, *i.e.*, a stabbing pain increased on deep breathing or coughing. More rarely dyspnoea, hæmoptysis or the coughing up of the cyst contents was the first indication of the disease. These are the outstanding symptoms in the majority of cases of hydatid infestation of the lungs.

The Symptomatology of Uncomplicated Cases.

The average duration of symptoms in the seven definitely uncomplicated cases in this series was three years, the time interval in different patients varying between five months and six years.

Such uncomplicated cases fall into three groups according as dyspnoea, hæmoptysis or pleuritic pain is the predominant symptom. Cough was present in every case, but only occasionally was it severe. Of course, a particular patient may complain of any or all of these symptoms, but in the majority of uncomplicated cases, one or other of these predominates.

The general condition of the patients was good. There was no loss of weight or strength, the appetite was excellent, night sweats were absent and in all but one patient there was no fever. In this one patient there was a remittent type of fever, varying between 37.2° C. and 38.3° C. for four weeks before operation.

Complications.

Three complications may supervene in pulmonary hydatid cysts, namely, degeneration, rupture or suppuration of the cyst.

Degeneration leads to no particular manifesta-

tions whereby its presence may be suspected, but it is often possible to diagnose the presence of rupture or suppuration of the cyst.

Rupture of the cyst into a bronchus results in a paroxysm of violent coughing and severe dyspnoea. Much watery fluid, with pieces of hydatid membrane and blood, is brought up.

After rupture the cough persists and secondary infection of the cyst usually occurs. The sputum may become foetid and muco-purulent, while blood and pieces of membrane are expectorated.

The general condition of the patient may remain good or signs of sepsis—fever, wasting and sweating—may supervene.

Sometimes after the cyst has become infected, rupture into the pleural cavity follows with the production of a pyo-pneumothorax. Less frequently a hydro-pneumothorax is caused by rupture of an uncomplicated cyst into the pleural cavity, in which case rupture into a bronchus usually occurs at the same time. Anaphylactic phenomena and urticaria are less often noted in cases of ruptured pulmonary cysts than in rupture of hydatid cysts elsewhere, because the cyst usually empties itself through the bronchus and the hydatid fluid is not absorbed to so great an extent.

Table II. shows that suppuration of a hydatid cyst often leads to none of the usual manifestations of sepsis. There may be no fever, wasting or sweating and the leucocyte count may be normal. Perhaps the absence of symptoms in these cases is due to the thickened adventitia preventing the absorption of toxic products from the cyst. In some cases the suppurating cyst may have established drainage through a bronchus. Other patients manifest the usual signs and symptoms of sepsis, in addition to those which accompany the uncomplicated cyst. A general systemic infection may follow this local suppuration.

Symptoms of Pulmonary Hydatid Disease.

These main symptoms of pulmonary hydatid disease will now be considered in more detail.

Pain.

Pain was absent in five patients of the series, while in three others there was no record of its presence or absence. The remainder suffered from pain of varying character and severity. In ten there is no record of the character of the pain. In some of these it may have been of the pleuritic type.

The duration of the pain varied between one day and five years.

The pain was usually referred to the lower portion of the chest of the corresponding side; less often to the upper part of the abdomen or to the shoulder.

Twelve patients complained of pain of the pleuritic type; in eight of these there was no previous history of pleurisy.

Nine patients had previously suffered from pleurisy at intervals up to sixteen years prior to admission.

In two the pleurisy had occurred so long a time previously (sixteen and twelve years before) that it was improbable that it had anything to do with the hydatid disease, though this, of course, may remain latent for years.

In five of the patients symptoms persisted from

the time of the pleurisy until the hydatid cyst was drained.

One patient who had been treated for intercostal neuralgia two years before, may be grouped with these cases.

Osler and McCrae⁽³⁾ state that pleurisy is rarely excited in echinococcosis of the respiratory system, yet eighteen of these patients, *i.e.*, 54.5%, give a history either of previous pleurisy, from which many of them dated their symptoms, or of a pleuritic type of pain for a period varying from one day to five months before admission.

In Australia, then, it is advisable always to consider the possibility of pulmonary hydatid infestation in any patient who complains of respiratory symptoms and gives a history of previous attacks of pleurisy or pain of a pleuritic type, especially if it has persisted for some months.

Hæmoptysis.

Hæmoptysis was noted in 57.6% of the patients. Usually it was well marked; less often the sputum was merely streaked with blood, continuously or at intervals.

Pinkish sputum was noted three times; when present, it is very suggestive of hydatid disease of the lungs. I have seen similar sputum in a case of amœbic abscess of the liver which had opened into the lung.

Hydatid membrane is usually expectorated after rupture of the cyst and with the onset of secondary infection, the sputum becomes muco-purulent.

Dyspnœa.

Dyspnœa was noted in 27.3% of the patients. It usually increases as the tumour enlarges, but is occasionally absent, even when a very large cyst is present.

Cough.

Cough of varying severity was present at some time or another in every case. Occasionally it was absent, except at intervals when blood was being expectorated.

General Systemic Manifestations.

The occurrence of fever, sweating and wasting are shown in Table II., where they are correlated with the condition of the cyst:

The general condition of the hydatid patient is usually good, especially before the onset of complications, such as suppuration and rupture.

It will be seen that fever was not present in 33% of the patients with unruptured suppurating pulmonary hydatid cysts. Ordinarily in lung cysts the adventitia is thin and absorption of toxins should be easy, but in a certain proportion of ruptured, suppurating or degenerated cysts the capsule may become thickened and so interfere with the absorption of toxic products.

Sweating was not a particularly frequent feature in any group of patients; it rarely occurred, save in connexion with suppurating or ruptured cases. This was also noted in regard to wasting.

Physical Signs of Pulmonary Hydatid Disease.

The physical signs usually found were those of fluid in the pleural cavity, while in the area around the cyst, signs of pulmonary congestion, consolidation or collapse were occasionally noted.

The cyst is usually found in the lower lobe of the right lung; consequently, the signs are usually most definite at the right base and in the right axilla. Less frequently they are more evident anteriorly towards the lower part of the right lung.

More rarely still are the signs in the left lung or at the apices of the affected lung.

(i.) *Inspection.*—Diminished respiratory excursion of the affected side is frequently observed.

Bulging of the chest wall was rarely noted (three patients), probably because the onset of complications led to a diagnosis before the cyst was large enough to cause any real deformity of the chest wall.

In only one patient was there any evidence of venous obstruction from pressure of the cyst. In this patient the superficial veins over the lower portion of the chest wall were very prominent.

(ii.) *Palpation.*—Vocal fremitus is usually diminished over the site of the cyst. When the cyst has ruptured and only the cavity remains, fremitus may be increased.

(iii.) *Percussion.*—Localized dullness, with a distinct sense of resistance, is practically always present over the cyst. Usually it corresponds approximately with the limits of the cyst; at times it may be quite sharply defined over a more or less circular

TABLE II.—GENERAL SYSTEMIC MANIFESTATIONS IN THIRTY-THREE CASES OF PULMONARY HYDATIDS.

Condition of the Cyst.	Fever.	Afebrile.	Sweating.	Wasting.
Normal..	2	7	—	1
Suppurating..	6	3	4	2
Ruptured—				
(a) With Secondary Infection	3	2	1	1
(b) No Secondary Infection	3	3	2	2
(c) With Degeneration	1	1	1	1
Degeneration Without Rupture	—	2	1	1
Total	15=45.5%	18=54.5%	9=27.3%	8=24.2%

area. Only when a small cyst is situated deeply in the substance of the lung is the percussion note unaltered.

(iv.) *Auscultation*.—The signs usually found are diminished or absent breath sounds, with diminished or absent vocal resonance over the affected area.

When a cyst is emptied more or less completely, amphoric breathing, with whispered pectoriloquy and other signs of cavity, may be present. These are very variable, depending on the condition of the cavity, whether empty or partially filled.

In the area around the cyst adventitious sounds are sometimes heard. Crepitations are found most frequently, while râles are occasionally audible. Rhonchi are sometimes heard over the chest, due either to associated bronchitis or to compression of the bronchi by the cyst.

When the cyst abuts on the pleura, a pleural friction rub is often found on auscultation.

Prolonged expiration and bronchial breathing may be present in the surrounding area, while signs of consolidation, e.g., tubular breathing and increased vocal resonance and fremitus, are occasionally observed when inflammatory complications are present.

Displacement of the Heart.

In five of the twenty-nine patients with the cyst in the right lung, the heart was displaced, while in four with the left lung affected, displacement of the heart was present in two and in another no note of its position was made. It would therefore seem that a cyst in the left lung is far more likely to cause displacement of the heart than is one in the right lung.

The Diagnosis and Differential Diagnosis of Pulmonary Hydatid Disease.

The various manifestations of hydatid disease of the lung frequently render diagnosis difficult. The subject will be discussed under the headings of the different clinical types the disease may assume.

I.—Latent Pulmonary Hydatid Disease.

Like echinococcal infestation elsewhere, hydatid disease of the lung may remain latent for long periods. This is well illustrated by the fact that of the thirty-three cases in this series, only nine, i.e., 27.3%, were diagnosed before the onset of complications led to the discovery of the cyst.

II.—Typical "Text-Book" Cases: The Classical Type of Pulmonary Hydatid Disease.

The history of cough, pain and hæmoptysis, with the maintenance of good general health and the absence of fever, suggests the possibility of pulmonary hydatid infestation. This possibility is strengthened by the finding of physical signs of fluid, particularly in the lower segment of the right side of the chest, while the presence of pieces of hydatid membrane in the sputum is, of course, diagnostic.

In 39.4% of these patients the condition was correctly diagnosed by clinical means alone, though in many of these the history of the coughing up of membrane made the diagnosis obvious.

Case No. 192 is a typical history:

A male, aged seventeen years. Five months before admission he first noticed pain on deep inspiration. This has gradually become more marked, but has never been severe. One month ago he coughed up some blood and matter. Cough was troublesome at the time, but soon disappeared. The general health has been good throughout and the highest temperature reached before operation was 37.3° C.

The heart was displaced to the left, the apex beat being found in the fifth space, 12.7 centimetres from the middle line. Dulness, with practically absent breath sounds and greatly diminished vocal resonance, was found in the right lung over a large globular-shaped area extending from a point in front of the anterior axillary line well back to the axilla. Around this area, superiorly and anteriorly, puerile breathing was present and vocal resonance was increased.

X-ray examination revealed a large, single hydatid cyst practically filling the right side of the chest. The heart was slightly displaced to the left.

At operation an uncomplicated hydatid cyst was found.

III.—Pulmonary Hydatid Disease Simulating Hydatid of the Liver.

Errors may arise in two ways in such cases:

(a) Sometimes cysts are present in both liver and lung and the pulmonary disease is overlooked when it is really the cause of the trouble. This occurred three times in this series and Case No. 179 may be taken to illustrate this difficulty in diagnosis:

A male, aged thirty years. Nine weeks before admission the patient suddenly commenced to cough and expectorated about a cupful of greenish sputum. Pain in the upper regions of the abdomen was present for the next three weeks. Cough and sputum have persisted, the latter being streaked with bright blood.

Below the right clavicle there was an area of dullness extending down to the liver dullness and out into the axilla. Over this area the breath sounds, vocal resonance and vocal fremitus were all diminished or absent. Posteriorly at both bases there was dullness, with diminished breath sounds, but increased vocal resonance.

The liver edge was felt two fingers' breadth below the costal margin.

X-ray examination showed a cyst opening into a bronchus. Though the leucocyte count was 7,500 per cubic millimetre and the temperature only twice in the week before operation was above 37.2° C., a suppurating cyst of the right lung was found.

Three weeks after the operation pericarditis developed and the liver edge was felt a hand's breadth below the costal margin. Three weeks later 750 cubic centimetres of blood-stained fluid were removed from the left chest and on exploring the left lung a little foul pus was obtained.

Next day erysipelas appeared on the face and the patient rapidly became worse and died with all the signs of severe sepsis.

Post mortem, in addition to the cavity of the cyst which had been drained, a hydatid cyst was found in the right lobe of the liver. There was turbid fluid in the left pleural cavity and a metastatic abscess between the liver and spleen. The cause of death was given as pyæmia secondary to a suppurating pulmonary hydatid cyst.

This case shows well the latency of hydatid disease until the onset of serious complications. The original diagnosis was hydatid disease of the liver. It is also interesting to note that, despite the practically normal temperature curve and leucocyte count, a suppurating cyst was present.

With suppurating hydatid cysts elsewhere, this same lack of the general manifestations of sepsis is often noted.

(b) The second difficulty in diagnosis between pulmonary and hepatic hydatids depends on the frequency with which cysts in the upper portion of the

liver give rise to physical signs at the base of the adjacent lung. Other similar conditions, such as amebic abscess of the liver or subphrenic abscess, frequently give rise to these confusing signs.

On physical examination it is found at the base of the lung that the percussion note is dull, the air entry is slight, the breath sounds may be diminished or even absent or distant tubular breathing may be heard, while adventitious sounds are usually absent. Such physical signs may easily lead to difficulty in diagnosis between a hydatid cyst of the liver or lung.

These signs are due to collapse of the lower portion of the lung adjacent to the cyst and probably result either from pressure collapse due to the elevation of the diaphragm or from absorption collapse from immobility of the diaphragm or perhaps from both conditions.

The elevated diaphragm squeezes the air from the alveoli of the lower portions of the adjacent lung, with resultant collapse of this part of the lung, while the immobility of the diaphragm prevents the expansion of the lower portions of the corresponding lung. As the air is slowly absorbed from the alveoli, the lung in this region gradually collapses.

Clinically it may be almost impossible to distinguish whether the cyst is above or below the diaphragm, but X-ray examination will usually localize the condition.

IV.—Pulmonary Hydatid Disease Simulating Phthisis.

In five of these thirty-three patients the condition was diagnosed as pulmonary tuberculosis. Three of the patients had undergone sanatorium treatment within the previous twelve months. The diagnosis was eventually made when hydatid membrane appeared in the sputum.

Two clinical types of hydatid disease are frequently diagnosed as phthisis. The first type is associated with a history of chronic pleurisy and this is considered to be due to infection with the tubercle bacillus, while in the other cases hæmoptysis is the leading symptom which suggests the diagnosis of tuberculosis.

Case No. 66 is illustrative of the first type:

A female, aged thirty-nine years. Two and a half years before admission she first noticed severe, stabbing pain in the left side, worse on deep inspiration. For some twenty months she was attending St. Vincent's Hospital and was treated for pleurisy of tuberculous origin. From there she was sent to a sanatorium for some months.

Three months before admission she came to the Melbourne Hospital with the same symptoms. Great relief followed the aspiration of fluid from the left chest, though during the process she expectorated a large amount of fluid.

Six weeks before admission she returned with similar symptoms and also complained of anorexia, flatulence, pain after meals, night sweats and wasting. She became dyspnoeic if she lay on her left side. The front portion of the chest had gradually become irregular in shape.

Since the chest was aspirated, sputum had been abundant, though prior to this it had been absent.

The day before admission she coughed up some hydatid membrane and so the diagnosis was made.

After admission the sputum was blood streaked and purulent and contained hydatid membrane.

One sister had been operated on for hydatid of the liver about a year previously.

In the lower part of the left side of the chest there was an area of dullness continuous in front with the heart dullness and extending round to the left base behind. Over

this area the breath sounds and vocal resonance were diminished, while in the infra-axillary region they were absent.

The heart was displaced to the right, the cardiac dullness covering three fingers' breadth to the right of the sternum.

The temperature for a fortnight ranged between 37.2° C. and 38.3° C. and thereafter was subnormal.

No surgical interference was necessary.

Case No. 19 illustrates the difficulty of diagnosis in patients with a history of hæmoptysis:

A male, aged forty-eight years. Five months before admission he first noticed a heavy feeling in the left shoulder (probably a referred pain from the region of the left diaphragm).

About this time a cough developed and five weeks before admission he had several attacks of hæmoptysis in the course of a few days. He brought up about half a cupful of blood on each occasion.

His general health since the onset of the pain had been indifferent, though he had managed to work intermittently. He had lost much weight and had suffered from night sweats. For three weeks before operation there was remittent fever, usually between 37.2° C. and 38.9° C.

Over the lower lobe of the left lung the breath sounds were diminished, crepitations and friction rub were present and the vocal resonance and fremitus were somewhat exaggerated. The heart was apparently not displaced. There were doubtful signs of a tumour in the right side of the abdomen.

No tubercle bacilli were found in the sputum.

The diagnosis was made by X-ray examination and at operation a suppurating cyst was drained.

The history of this case was very suggestive of tuberculosis, but the signs were towards the base and X-ray examination enabled a correct diagnosis to be made, a matter of considerable importance, since the cyst was suppurating and the general condition of the patient was bad. Surgical treatment was successful.

It should always be remembered that a pulmonary hydatid cyst is by no means a rare cause of pleurisy or of chronic pain of the pleuritic type.

The presence of physical signs at the base of the lung, especially on the right side, the good general condition of the patient with the absence of fever before the cyst is secondarily infected and the presence of a marked eosinophilia are all points in favour of hydatid disease as compared with pulmonary tuberculosis. The examination of the sputum, X-ray examination of the chest and the result of the complement fixation test of the blood for hydatid usually settle the diagnosis, though the two conditions may be present together.

Indeed, a recent *post mortem* examination revealed the lesions of syphilis, tuberculosis and hydatid disease in the one patient.

V.—Hydatid Disease Simulating Malignant Disease of the Lung.

Two patients in this series were suspected to have malignant disease of the lung. Further investigation enabled the correct diagnosis to be made in the one, while in the other the condition was not correctly diagnosed until the tell-tale membrane appeared in the sputum.

His history (Case No. 20) is as follows:

A male, aged forty-seven years. Since he suffered from a right-sided pleurisy three years before admission, the patient had not been quite well. Eight months before admission a cough developed and soon hæmoptysis, usually slight, became a constant symptom. On one occasion, however, about half a litre of blood was expectorated. Slight pain had been present in the lower region of the right side

of the chest. He had lost some weight and had suffered from night sweats.

Some relative dullness with prolonged expiration was present at the right apex in front. Posteriorly over the lower lobe of the right lung there was dullness, with diminished breath sounds and vocal resonance.

X-ray examination revealed a small, non-pulsating tumour near the root of the right lung. Tubercle bacilli were not found in the sputum. The hæmoptysis persisted and, after being observed for a month, the patient was discharged with the diagnosis of malignant disease of the lung.

Ten weeks later he was readmitted. In the interval he had had daily hæmoptysis, sometimes as much as 280 cubic centimetres of blood being expectorated. He had lost much weight and his skin was always clammy.

There was no dyspnoea. An offensive taste was often noticed on turning on to one side.

At the right base there was dullness, with diminished breath sounds and increased vocal resonance. A few crepitations were present.

There was no fever for nearly the whole period of four months during which the patient was in hospital.

X-ray examination disclosed a rounded shadow about the size of a coconut at the right base, with some normal lung tissue between the tumour and the diaphragm.

On several occasions the sputum was examined for tubercle bacilli and malignant cells, but none was found. Finally, some hydatid membrane was expectorated and at operation a degenerating cyst was drained.

In all obscure lung conditions, especially with signs at the right base, the possibility of hydatid infestation should always be carefully considered. In the case of the patient whose history has just been given, hydatid disease seems to have been rather hastily dismissed, despite the X-ray report of a tumour of the lung.

VI.—Hydatid Disease Simulating Pleural Effusion.

Most pulmonary hydatid cysts give the physical signs of fluid within the pleura, while in the area surrounding the cyst there is often evidence of congestion or collapse of the adjacent lung.

Seven cases in this series (21.2%) were diagnosed as pleural effusion. Two of these cysts were suppurating and in these the provisional diagnosis was empyema.

Case No. 58 illustrates this clinical type of pulmonary hydatid disease:

A male, aged twenty-nine years. The patient had been ill for three weeks with pleurisy and pneumonia eighteen months before admission. Rusty sputum was expectorated on this occasion.

Twelve months before admission pleuritic pain again developed in the right side of the chest. Cough with sputum was present, but there was no hæmoptysis. He remained in hospital for several months.

During this time about half a litre of clear fluid was withdrawn from the right side of the chest on one occasion, with the result that immediately after he commenced coughing and in a few hours expectorated about half a litre of offensive brown fluid. A few weeks later he left hospital, but within three weeks left-sided pleuritic pain developed and fluid was withdrawn from the left side of the chest. One month later (five months before admission) he coughed up pinkish sputum containing membrane like a grape skin. Since then his cough has persisted, with pinkish, offensive sputum and occasionally blood and "grape skins" have been expectorated. Finally the hydatid membrane in the sputum was identified. His general condition had been satisfactory. There was some slight loss of weight, but no fever was present before operation.

The heart was not displaced, the apex beat being in the fifth space, 3.75 centimetres inside the nipple line.

There was dullness at the right lung posteriorly up to the angle of the scapula. Over this dull area, the upper and lateral borders of which were curved, the breath

sounds, vocal resonance and vocal fremitus were all diminished, while a pleural friction rub was audible near the angle of the scapula.

An uncomplicated cyst was drained and three months later a degenerating cyst (situated just where the initial pleural pain of eighteen months before had been felt) was also drained.

Here the physical signs were those of fluid at the right base, but the curved upper border of the dull area would be evidence in favour of hydatid cyst. The upper border of dullness in a non-loculated pleural effusion usually slopes downwards and forwards from the spine.

The most frequent error in X-ray examination in hydatid disease of the lungs is to diagnose the condition as a pleural effusion. This mistake should be guarded against as far as possible, for disastrous results may follow the attempt to aspirate a pulmonary cyst.

VII.—Pulmonary Hydatid Cases Simulating Pneumonia.

Suppurating cysts are occasionally mistaken for pneumonia, either lobar or lobular. Case No. 195 illustrates this:

A male, aged sixty-nine years. The patient complained of increasingly severe pleuritic pain in the right side for eight weeks. Sputum was abundant and greenish yellow, but no tubercle bacilli were found in it. He had sweated occasionally at night and for the fortnight he was in hospital before his death the temperature was remittent and intermittent up to 38.3° C. The pulse rate was under 100 per minute until the last two days, while the pulse-respiration ratio throughout had been about 2:1.

At the right axilla and right base there was dullness, with diminished breath sounds, increased vocal resonance and crepitant râles. Later a patch of tubular breathing, with increased vocal resonance, was found just above this dull area.

Pus was obtained on needling the right base some few hours before death.

Post mortem examination disclosed a large, old, suppurating hydatid cyst of the right lower lobe of the lung and a small degenerated hydatid of the left lobe of the liver.

VIII.—The Dyspnoic Type of Pulmonary Hydatid Disease.

In a definite group of cases of pulmonary hydatid disease, dyspnoea is the main symptom, while numerous rhonchi are found all over the chest from compression of the bronchi. Two such cases in this series were diagnosed asthma, probable uræmia and chronic bronchitis with cardiac failure. The history of the former—Case No. 209—is as follows:

A male, aged sixty-four years. The patient was quite well till three weeks before admission, when he noticed a bubbling, wheezing feeling at the base of the right lung. This peculiar sensation persisted and a few days before admission he experienced great difficulty in breathing. Pleuritic pain was present. He passed urine six times during the day and three times during the night.

Wheezing and dyspnoea, especially expiratory, were marked. The chest was barrel-shaped, with limited respiratory excursion. The left lung manifested the physical signs of emphysema. Dullness was present all over the right lung, except for a small portion near the liver. The breath sounds and vocal resonance were diminished, while scattered crepitations and numerous sibilant rhonchi were audible.

The blood pressure was 140 millimetres systolic, 100 millimetres diastolic. The urine was acid; its specific gravity was 1.020; it contained some albumin.

The leucocyte count was 24,000 per cubic millimetre.

There was no fever during the three weeks before operation. On needling the chest a little pus was found.

On skiagraphic examination a doubtful localized effusion was diagnosed.

At operation a suppurating cyst was drained.

Symptoms and signs in this case were due to pressure of the cyst on the surrounding lung and bronchi, resulting in diminution of the available air space, with dyspnoea, and causing numerous rhonchi audible all over the chest on the affected side.

Diagnosis.

The Value of the X-Rays in Diagnosis.

Reports on the skiagraphic appearances were available in twenty-eight of these cases. In sixteen the diagnosis was either definite or probable hydatid disease. In five cases the report stated that a large shadow or an opacity was present in the affected lung. In seven cases (25%) the diagnosis was faulty, the most common error being the assumption of a pleural effusion. Other diagnoses were malignant disease of the lung, diaphragmatic hernia (in a case complicated by pneumothorax after needling) and ruptured subphrenic hydatid cyst. In the case of one ruptured cyst, nothing abnormal was seen on X-ray examination.

In the majority of cases of pulmonary hydatid disease, the X-ray diagnosis is reliable and it is certainly a great improvement on the clinical diagnosis.

The Complement Fixation Test.

The complement fixation test in hydatid disease is a very valuable addition to our diagnostic methods and in any doubtful pulmonary condition advantage should be taken of these aids to clinical diagnosis.

Biological Aids to Diagnosis.

Just before Dr. N. Hamilton Fairley left for India, we had been investigating the value of the Casoni intra-dermal test in echinococcal infestations. At present the figures are insufficient to enable any definite conclusions to be drawn. Later the results of this investigation will be published.

As in other helminthic infestations, the cellular response is mainly limited to the eosinophile cells, but the value of the eosinophile cell count in diagnosis is slight. Welsh and Barling⁽⁴⁾ investigated this aspect of the disease and concluded that a well-developed eosinophilia was an inconstant characteristic of the blood in hydatid disease, being present in 50% of their patients before operation. In 25% there was a minor increase, while in the remaining 25% the eosinophile counts were normal or subnormal. Differential leucocyte counts were recorded in only three of these thirty-three cases, the results being 33% and 8% of eosinophiles in two cases, each with a total leucocyte count of 10,000 per cubic millimetre, while in the third it was merely stated that a definite eosinophilia was present.

To sum up, we may say that the diagnosis of pulmonary hydatids may be easy or difficult. The cyst may remain latent for long periods. The main symptoms are usually cough, pleuritic pain, hæmoptysis and dyspnoea.

Pulmonary tuberculosis and pleural effusion are the conditions most frequently simulated by hydatid disease, this being due to the frequency of hæmoptysis,

pleural pain and signs of fluid in the chest of persons suffering from hydatid disease.

Other conditions to be borne in mind are pulmonary abscess, gangrene, malignant disease of the lung, pneumonia (lobar or lobular), chronic bronchitis, asthma, subphrenic conditions, especially hydatid of the liver, aneurysm and syphilis of the lung. In the past eighteen months in several cases diagnosed as probable hydatid disease of the lung by X-ray and clinical examination, the serum gave no response to the hydatid complement fixation tests, but reacted to the Wassermann test, the condition apparently being due to tertiary syphilis of the lung.

The diagnosis of pulmonary hydatid disease will be made most frequently by the physician who keeps the condition constantly in mind, and in any obscure pulmonary condition has an X-ray examination of the lungs made and the patient's blood tested by the complement fixation test for hydatid disease.

It is always to be remembered that echinococcal infestation is frequently multiple and it is therefore essential to determine as far as possible whether other cysts are present or not.

Prognosis.

Of nine patients with uncomplicated hydatid disease, one died suddenly four weeks after operation when apparently doing well. A few days before the wound had become infected with the *Bacillus coli communis* and a Gram-positive anaerobe. No *post mortem* examination was allowed.

Two patients with suppurating cysts were not subjected to operation and both died.

One of the seven patients with suppurating cysts treated by drainage died. The cause of death of this patient (No. 179, see earlier) was pyæmia.

All of the fifteen patients with ruptured or degenerated cysts recovered.

The immediate prognosis of cases of pulmonary hydatid disease, if subjected to operation, is good. A suppurating cyst of the lung requires early and efficient drainage.

The later prognosis should be more guarded, for in these thirty-three patients there was definite evidence of multiple infestation in 39.4% and more than half of these were subjected to further surgical interference within a few years of the original operation.

Treatment.

Ten patients were not subjected to operation. Two of these had suppurating cysts and both died. In the other eight the cyst had ruptured and X-ray examination or exploratory needling disclosed nothing grossly abnormal. These all progressed satisfactorily. One partially ruptured degenerated cyst was aspirated with excellent result.

The remaining twenty-two patients were operated on and two died. In one the cyst was uncomplicated, while in the other suppuration had occurred.

One degenerating cyst was successfully closed without drainage, but another similar case closed without drainage had to be reopened and drained. In the other twenty cases the cysts were all drained, the operation being done in nearly every instance at one sitting. Usually the pleural cavity was found

to be shut off by adhesions; if not, the two layers of the pleura were stitched together before the cyst was opened.

Of the twenty-three patients subjected to operation, including the one whose cyst was aspirated, only two failed to show any post-operative rise of temperature. In one the cyst was suppurating and in the other it had undergone degeneration. Fever of varying degree was present in the other patients for periods from two days to six weeks after operation. The maximum post-operative temperature seldom reached 39.5° C.

The average febrile period after operation in nine patients with uncomplicated cysts was fourteen days and in seven with suppurating cysts was fifteen days, while in four in whom the cyst was degenerated (in two of these it had also ruptured) this period was seven days. One of these degenerated cysts had been aspirated and another closed without drainage. Two infected ruptured cysts and one non-infected were drained. The patients showed a rise of temperature after operation for two, three and six days respectively. The remaining patients with ruptured cysts did not require surgical interference.

It appears that the post-operative pyrexia does not depend to any great extent on the condition of the cyst.

No apparent relationship was observed between the presence or absence of pre-operative fever and the duration of the post-operative febrile state.

Figures were too scanty to enable any conclusions to be drawn with regard to the relationship between the type of operation and the period of post-operative fever.

The average period spent by these patients in hospital after operation was as follows:

When not subjected to operation (ten patients), twenty-seven days.

When aspirated (one patient with a degenerating cyst), thirty days.

When successfully closed without drainage (one patient with a degenerating cyst), fifteen days.

When the cyst was drained (twenty-one patients), fifty-nine days.

It would appear that with a degenerated pulmonary cyst not secondarily infected, an attempt might be made to close the cavity without drainage, but in all other cases the operation of choice is presumably incision and drainage of the cyst. Where the cyst has ruptured into a bronchus and completely emptied itself, surgical interference is unnecessary.

The dangers attending aspiration of a pulmonary hydatid cyst are well known and an exploring needle should not be used in any suspected case until a rib has been resected or the surgeon is ready to open into the cyst immediately if it be found.

After-Results.

One patient was discharged with a persistent bronchial fistula. Of course, it was impossible to follow up many of these patients, but 24% of them returned to hospital within the next few years.

Some were subjected to further operation. In one case the cavity remaining after evacuation of the cyst had not collapsed, so several ribs were resected to allow the chest wall to fall in and obliterate the space. From another patient thirty centimetres of foul gauze were removed from the old cavity, while others had further cysts opened and drained.

Conclusions.

Despite the difficulty of diagnosing hydatid disease of the lung before the onset of complications, the results of treatment are usually satisfactory, but with earlier diagnosis still better results should be obtained. Early diagnosis depends on the physician having an X-ray examination of the chest made and the complement fixation test of the blood for hydatid disease applied in every obscure or atypical pulmonary condition.

Acknowledgements.

I would like to thank Dr. S. W. Patterson for his kindly criticism of this paper while it was in the course of preparation.

My whole outlook on hydatid disease has been to a great extent moulded by the teaching of Dr. N. Hamilton Fairley and throughout this paper the influence of his thought is manifest. To him also my thanks in no small measure are due.

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Reports of Cases.

DEATH OF FŒTUS IN UTERO, MISSED LABOUR AND DELIVERY BY CÆSAREAN SECTION.

BY ALBERT H. HUGHES, M.B. ET CH.B. (MELB.),
Melbourne.

M.G., aged forty years, was expecting to be confined in the first week of November. She had had two living children, aged thirteen and eleven years respectively. Both were healthy. Since the birth of the second child she had had one miscarriage and one still-born child, the last about two years ago. Two weeks before her expected confinement she consulted me, being under the impression that the fœtus had died. On examination I agreed with her view and expressed the opinion that in a week or so labour would set in and she would be delivered in the usual way.

On December 1, 1921, labour had not supervened. An examination disclosed that the cervix was not at all taken up and was as hard to the touch as in the non-pregnant condition. The general condition of the patient was good, but she was worried by the abnormal length of time of the abdominal enlargement. On the morning and evening of the following day and of the two subsequent days I administered pituitrin (one cubic centimetre) intra-muscularly, but without any effect on the uterus. I then decided to empty the uterus mechanically.

The problem which now presented itself was which was the safest way of carrying this into effect, either (a) from

below, by means of packing the cervix with gauze or insertion of bougies, etc., or (b) by Cæsarean section. After consideration, I decided to adopt the latter method, for the following reasons: (i.) The former methods might not be successful, because of the rigidity of the cervix. (ii.) If these methods failed, there would be, on account of the difficulty of sterilizing the vaginal tract and maintaining it in a sterile condition, the added risk of introducing dangerous micro-organisms into a uterus already containing a dead fetus and thus bringing about a very formidable condition.

At the patient's request I delayed operation until after Christmas. On December 31, 1921, at a private hospital I delivered her by means of abdominal Cæsarean section of a dead male child, weighing 3.2 kilograms, of a period of development of at least eight months. The child was thus delivered at least two months after the expected time of delivery and ten weeks after its death *in utero*. The patient stood the operation well and made an uneventful recovery.

This case appears to me to be of interest on account of the extreme hardness of the cervix at a period of pregnancy nearly full time and by reason of the retention of the fetus for such a prolonged period.

I wish to acknowledge the skilful help of Dr. Frank Meagher, who assisted me in the operation, and Dr. T. Tighe, who administered the anæsthetic.

Reviews.

MIDWIFERY.

JELLETT's well-known "Manual of Midwifery"¹ has undergone extensive revision and, with the assistance in special subjects of Drs. Dawson, Drury, Moorhead and Rowlette, has been brought thoroughly up to date.

In Part I. the anatomy of the bony pelvis of the genital organs, pelvic floor and mammary glands is dealt with and the anatomy and embryology of the ovum and the fetus are clearly described. It is well illustrated and embraces sufficient of these subjects for practical purposes. There are helpful diagrams to explain pelvic obliquity and the transmission of the body weight along the different planes. Bryce and Teacher's earliest human ovum is described in connexion with development.

The practical point is taught that substances such as alcohol and chloroform pass through the placenta and therefore affect the fetus. The hypothesis that there is an internal secretion of the placenta is favoured. The author does not mention the weight of the placenta in relation to the weight of the fetus, which is supposed to be one in five, but when syphilis is present one in three.

Midwifery would be more interesting to the general practitioner and mistakes fewer if its fundamentals, as described in this section, were studied.

The title of Part II. is "Obstetrical Asepsis and Antisepsis, Armamentarium and Diagnosis." The author points out that the acid vaginal secretion possesses a bactericidal action on pathological organisms and that this is weakened by antiseptic douches. During a recent discussion at the Royal Society of Medicine, certain forms of puerperal sepsis were attributed to *Bacillus coli communis* infection transmitted from the perineum to the genital tract. Dr. Jellett very properly states such infection is not truly autogenous; the medical attendants must still be held responsible. Infinite care must be taken to disinfect the perineum and external genitals (Victor Bonney recommends brilliant green) and limit vaginal examinations as much as possible. Rectal examinations can often be substituted for vaginal examinations. The practice of

abdominal palpation by the methods graphically described in this volume is essential to successful midwifery.

Ante-partum hæmorrhages are clearly handled. In both forms, active labour pains should suggest the wisdom of puncturing the membranes. Cæsarean section is not favoured for *placenta prævia* unless under the rare circumstances of a central *placenta prævia*, a rigid, undilated os *uteri*, the patient near full term and the child alive and viable. As a rule, the author considers bipolar version the method of choice. In external accidental hæmorrhage plugging is recommended, provided the uterine wall is healthy, the membranes unruptured and the plugging properly applied. Anæsthesia is usually necessary. For the concealed form of accidental hæmorrhage, in the absence of labour pains, if severe, Cæsarean section should be performed.

The chapter on Cæsarean section, its indications and technique is excellent. Silk for suturing the uterine incision is recommended. Some authorities prefer chromic or plain catgut. We gather that the author is averse to cervical incisions, whether extra- or trans-peritoneal.

In the treatment of the second degree of pelvic contraction, pubiotomy is held to be the procedure of choice, then Cæsarean section and induction of labour only under special circumstances, such as refusal of the other two. The author makes the point that it is useless to induce labour after the thirty-sixth week, as from that date there is little or no increase in the size of the fetal head. Surely delivery is easier at the thirty-sixth week than at full term.

The treatment of eclampsia is discussed with moderation and judgement. On the whole, the treatment adopted at the Rotunda Hospital, Dublin, is held to be the best for the general practitioner. It consists in washing out the stomach and bowel with bicarbonate of soda solution and warm water, introducing Epsom salts or castor oil into both and giving morphine every two hours. Labour is shortened as soon as it can be done without injuring the cervix. Many practical points of great value are given.

We hope we have said sufficient to indicate the high opinion we have formed of this work. In our opinion, there is no better guide to the practice of midwifery.

A MODERN GEOGRAPHY.

In the series comprising the "Atlas Geographies" the authors are working out an attempt to teach geography on a new plan.¹ The different books in the series are not only graded according to the mental development of the scholars in different parts of a school, but as a result of the difficulty with which we have all been faced at some time or another of learning geography from a text-book divorced from an atlas, the authors supply both atlas and text-book in the one volume.

Part III. of the Senior Series, which has come under notice, deals with Europe; a brief study of the book in question leaves no doubt of the clearness and interest resulting from the new method, in addition to the saving of time which results.

Orographical maps of the continent as a whole and then of different sections of the continent form the basis of the study. From these the student is led on to the resulting natural resources and the trade routes of each country and thus to an intelligent appreciation of the reasons for its commerce, its fluctuations in prosperity and importance during historical times. Thus the pupil gets an insight into physical and commercial matters. Loose maps and transparent route maps enable the student to work out facts for himself and each section is followed by very practical and interesting questions. Published since the war, the maps have the additional advantage of embodying the results of the Peace of Paris, and the historical summaries show geographical reasons for many of the much-discussed decisions of that Peace Conference.

¹ "A Manual of Midwifery for Students and Practitioners" by Henry Jellett, B.A., M.D., F.R.C.P.I., L.M., and David G. Madill, B.A., M.B., B.Ch., B.A.O., L.M.; 1921. London: Baillière, Tindall & Cox; Demy 8vo., pp. 1,200, with 20 plates and 570 figures in the text. Price: 42s. net.

¹ "The Atlas Geographies: A New Visual Atlas and Geography Combined; Part III., Senior Geography; No. 2, Europe," by Thomas Franklin; 1921. Edinburgh: W. & A. K. Johnston, Limited; General Agents, Macmillan & Company, Limited, London; Crown 4to., pp. 148. Price: 7s. 6d. net.

The Medical Journal of Australia

SATURDAY, APRIL 1, 1922.

The Therapeutic Use of Alcohol.

IN a recent issue of *The Journal of the American Medical Association*, the final report of the referendum on the use of alcohol in the practice of medicine is published. The information contained in this document is of considerable importance, even if it is obviously impossible to arrive at a conclusion which may be regarded as the "considered opinion of the whole profession." A *questionnaire* was addressed to 54,900 medical practitioners in the United States of America. This number represents 37% of the total number of registered practitioners. Replies were received from 31,115, or 58%, of those to whom the questionnaire was sent. The first three questions sought the opinion of the practitioner as to whether whisky, wine or beer was necessary as a therapeutic agent. Those who regarded whisky as a therapeutic necessity, represented 51% of those answering this question. Medical practitioners in the larger cities voted in favour of whisky to the extent of 58%, while a slight majority of country practitioners were of opinion that whisky was not necessary. The opinion became more pronounced in favour of regarding whisky as an essential method of treatment when the medical practitioners of the fifty largest cities were considered.

Under one-third of the medical practitioners replying to the question regarded wine as a therapeutic necessity, while just over one-quarter held the same opinion in regard to beer. It is interesting to note that in California, which may be regarded as the wine producing district of America, the vote in favour of wine as a therapeutic agent was given by 415 out of 1,227, or 33.8%. In a similar way the vast majority of the practitioners in the cities formerly regarded as the centres of brewing were unconvinced of the therapeutic importance of beer.

The fourth question dealt with the diseases or conditions necessitating the use of whisky, wine or beer. From the figures quoted above, it will be

seen that whisky alone need be considered. It may further be pointed out that the term whisky was held to include brandy and other spirits. Those who employ spirits for therapeutic purposes, use it chiefly in pneumonia, influenza and the acute infective diseases. Some value whisky in the treatment of diseases incidental to old age and in general debility, while a smaller number employ it with apparent advantage in diabetes, heart failure and shock.

The replies to the question: "Have instances occurred in your own practice in which unnecessary suffering or death has resulted from the enforcement of prohibition laws?" are said to be disconcerting. Some were humorous, some tragic and some even rabid. The next question was also unlikely to reveal important information. It had reference to the number of times the practitioner found it advisable to prescribe alcoholic beverages as therapeutic agents.

In reply to a direct question, 57% were in favour of the imposition of some form of restriction on the prescription of alcohol in medical practice. Of 29,727 medical practitioners replying to this question, only 3,656, or 12%, wished to prevent the prescription altogether. The remaining distribution of the votes is interesting. Those wishing to limit the number of alcohol prescriptions in any three months to fifty, represented 9%; those who extended the limit to between fifty-one and one hundred in three months, represented 18%; only 2% wished for the right to prescribe more than one hundred alcohol prescriptions in three months. The remaining 16% did not specify the extent of the restrictions regarded as wise. This leaves 43% of those voting as being opposed to any restrictions.

In order to understand the significance of the figures, it is necessary to remember that many prohibition laws of the American States are much more severe than the Federal laws. There are seven so-called "dry" States. In fifteen States there are restrictions dealing with pure grain alcohol. In four States there are no restrictions, while in the remainder the laws forbid the sale of whisky and other alcoholic beverages, except under strict control. Notwithstanding these varying laws, a very large number of medical practitioners record extensive violations of the regulations. They are influ-

enced in their replies by the natural repugnance at being made the channels through which the healthy citizen seeks to evade the prohibition laws. One very important opinion is frequently registered by those making the returns. It is that the quality of the liquor provided at the licensed store on the presentation of a prescription is inferior to that obtainable in a clandestine way elsewhere. This would appear to be a severe indictment, since "moonshine" and other alcoholic beverages are freely spoken of as being harmful. While the majority appear to submit to the law and even to endeavour to uphold it, some practitioners are frank in confessing that in emergencies whisky can be "bootlegged" over the border without difficulty when the red-tape and irksome restrictions to its genuine therapeutic use render this course advisable. Complaints are made in regard to the difficulty in obtaining supplies of alcohol for laboratory use and for other technical purposes. Regulations exist which enable medical practitioners to obtain permits to purchase alcohol for these purposes, but in many instances these regulations are not fully understood. The claim is made by many that a medical practitioner should be trusted to use his discretion without irritating restrictions. On the other hand, others point out that prescriptions are given almost casually for trivial ailments.

It is possible that this matter may have to be decided some day in the Commonwealth. The experience in America appears to indicate that a medical referendum cannot command a scientific response. The opinions are to a greater or lesser extent those of men and women with strong views on the moral and social issue. Clinical experience, divorced from political or personal views concerning the harm done by alcohol when taken in excess, should result in a reply more uniform than 51% for and 49% against. We note, furthermore, that one very pertinent question was not included. It is whether there is any evidence of abuse of alcoholic beverages as a result of their use as therapeutic agents. If there could be a guarantee that alcohol intended for this purpose would not be misused, the issue might be clearer. As the matter stands in America to-day, it must be admitted that the medical profession cannot give an unequivocal opinion on this extremely important question.

THE BIOLOGICAL SIGNIFICANCE OF STIMULI.

THE study of the pathology of disease necessitates the application of the laws of the so-called exact sciences and the adaptation of the methods of scientific investigation. Demonstrable facts have to be collected, collated and evaluated. But after all the available evidence has been ordered, the pathologist finds that his reasoning is hemmed and restricted because he comes in contact with the fact that he is dealing with living cells and tissues and he has no conception of the meaning of life. Usually the pathologist seeks to evade the issue and to express his finding in terms of chemistry or physics. Many of the mysteries of disease baffle all endeavours at disclosure because the biological part of the problems is beyond the comprehension of man. We have pleaded for a sounder education of medical students in chemistry, physics and biology, because the functioning of the body in health and disease depends on chemical, physical and biological processes. It is unpermissible to neglect any one of the three factors, notwithstanding the impossibility of definition of vital processes. If the biological influence be ignored, the problem may be presented in a false light. On the other hand, it must be remembered that all hypotheses concerning the natural and changed functions of the body may be erroneous, since it is outside the wit of man to ascertain the nature of the influence exercised on chemical or physical phenomena by vital processes inherent in the body. The modern physiologist and pathologist is too prone to reduce all physiological or pathological processes to terms of visible or ponderable substances. In the doctrines of immunology the modern pathologist is inclined to postulate the antibody, the hypothetical something which manifests itself as a reaction to a chemical or biological stimulation, as a formed substance with size, shape, weight and density. Similar properties are attributed to the something responsible for growth, nutrition and metabolic balance. The modern physician speaks glibly of vitamins, of hormones, of metabolic toxins, although he is aware that the evidence on which the existence of these "somethings" is based, is, the response of a living cell or living tissue to a combination of circumstances.

Rudolph Virchow, who may perhaps be described as the most materialistic of the world's great pathologists, recognized over sixty years ago that the biological element in all problems of the living body was a determining factor and that it was necessary to postulate the "supreme biological law" as a working hypothesis, subject to revision only when the nature of life is discovered. Various endeavours have been made before the days of Virchow to identify life with the power to react to stimuli. Virchow, however, recognized that this power was merely the essential attribute of the living cell and of the derivatives of living cells. As a result he claimed that every living cell and every living derivative of animal cells are capable of being stimulated. The function of the living cell depends on its chemical and physical characters on which

stimuli of divers kinds can act. Virchow distinguished three types of stimuli: the functional, the formative and the trophic. Few pathologists or physiologists have attempted to complement the philosophy of Virchow and to dovetail into the chemical and physical fragments of modern pathology the biological pieces necessary to construct a homogeneous whole. On the occasion of the centenary of Virchow's birth Professor August Bier has summarized his views of pathological processes checked and tested in the light of this biological conception.¹ According to Virchow, functional stimuli are those physical and chemical stimuli which produce contraction, innervation and secretion. Professor Bier insists on the recognition of this form of stimulus, because he can conceive no other way in which the differences of reaction to the several types of stimuli can be recognized. Functional stimuli can be single, followed immediately by a reaction which passes off at once, or repeated, which give rise to persistent excitation. He refuses to recognize inactivity of any living organ or cell aggregation. The function may not be manifested to the eye or ear. For example, he cites the instance of bone. A joint may be immobilized and ankylosis may result. The ankylosis will not occur in the absence of bacterial or other strongly acting stimuli in addition to the enforced immobility. It is a common experience that the temporo-maxillary joint on one side may become ankylosed while its fellow escapes unchanged. Every function corresponds to a definite structure and every definite structure corresponds to a special function. Non-use does not lead to a destruction of an organ any more than use preserves it.

Professor Bier attaches great importance to the formative stimuli. He explains the changes in the expectant mother as the reaction to the stimuli of the impregnated ovum in the uterus. He regards the inflammatory stimulus of an acute osteomyelitis as the cause of the regeneration of bone, even when the limb is immobilized. In his opinion, regeneration and hypertrophy are typical reactions to formative stimulation. It is usually taught that true healing does not take place in the higher mammals. That healing is and should be affected without cicatricial patch-work is demonstrated by the repair which follows the careful removal of the anterior half of the tibia. A few months later, even an expert histologist will be unable to detect any difference between the repaired bone and its untouched fellow. In order to achieve this result, it is necessary to provide a suitable stimulus from the medulla. Since Professor Bier is satisfied that the stimulus necessary to effect this reaction is identical with that which produces growth, he holds that it must be of the nature of a hormone. It would, perhaps, have been better had he avoided this assumption, for the use of the word hormone does not bring the pathologist any nearer to a tangible understanding of the "something" that acts as a stimulus and results in growth. In a similar manner he produces what appears to be *prima facie* evidence

of the action of stimuli capable of inducing regeneration in other tissues. He has some remarkable information to give concerning the regenerated tissues. Perfect repair of the divided *tendo Achilles*, for example, of the rabbit is shown to have proceeded to such an extent within six days that the mended tendon is capable of supporting a weight twenty times that of the whole body.

The important function of nutritive stimuli is to cause the cell to take up food. Professor Bier adduces reasons for supporting Virchow in the claim that the cell nourishes itself and is not "spoon fed." The unimpregnated ovum does not last long, even when ample nourishment is available. Impregnation supplies the stimulus and the impregnated ovum is capable of taking up the food necessary for its life and development. Inflammation or trauma may damage muscles, nerves and other tissues and lead to atrophy. He shows that no exercise of the inflamed or injured muscles will prevent the atrophy if its nutrition is disturbed. Phenomena like the gain in weight after the injection of even small quantities of animal blood are interpreted as evidence of the reaction to nutritive stimuli. He provides many other examples.

Stimuli belong to one of two classes. There are the external stimuli, such as light, heat, electricity, pressure and the like. The internal stimuli are either chemical or physical. Exercise in the open air provides stimuli of a healing character. The study of these stimuli would place physical culture on a much more scientific footing. In applying stimuli it is essential that the reaction should be kept within moderate bounds. In general it may be stated that the responses to stimuli are purposeful and can be rendered beneficial. According to Professor Bier, both inflammation and fever are stimuli which can and should be favoured up to a definite degree to further the process of healing. Years ago he showed that artificial hyperæmia was capable of controlling a local infection, provided that it was carefully measured. Nature causes the body to respond to bacterial absorption by a febrile reaction. This reaction is the expression of Nature's endeavour to overcome the infection and Nature frequently succeeds. Similarly, the dissociation products of proteins and other chemical substances within the body act as stimuli and within certain limits can give rise to reactions which are healthful. The modern protein therapy is based on this hypothesis and has been found to be of great value if properly applied. It is, however, necessary to regulate the reaction by applying the mildest stimulus that will serve the purpose. Professor Bier refers to the Arndt-Schultz law, which can be tested in a thousand and one ways. It is that weak stimuli incite the activities of life; moderately strong stimuli promote these activities; strong stimuli inhibit them; the strongest stimuli arrest them. There is a wide field open for further research along the lines indicated by Virchow. Professor Bier has given a lead and others will no doubt follow. By recognizing the nature of the stimuli involved in a special reaction, we may be enabled to apply them to advantage in pathological processes.

¹ *Münchener Medizinische Wochenschrift*, November 18 and 25, 1921.

Abstracts from Current Medical Literature.

THERAPEUTICS.

Magnesium Sulphate Lavage of the Duodenum.

B. B. CROHN, J. REISS AND M. J. RADIN (*Journal of the American Medical Association*, June 4, 1921) record a series of investigations regarding the diagnostic significance and therapeutic results of duodenal lavage with solutions of magnesium sulphate. Reference is made to the pioneer work of Meltzer, who had previously suggested that a concentrated solution of a magnesium salt introduced into the duodenum through a duodenal tube, by causing a relaxation of a badly functioning sphincter at the papilla, might tend to relieve jaundice in the presence of biliary stasis due to abnormal rigidity or passivity of the sphincter. Following this suggestion, Lyon of Philadelphia, advanced the hypothesis that if magnesium sulphate caused relaxation of the sphincter, in accordance with the law of reciprocal innervation a simultaneous contraction and evacuation of the gall bladder should ensue. By collecting the fluid in the duodenum after the lavage, he proposed a diagnostic test for disease of the gall bladder based on a study of the amount, character, cytology and bacteriology of these contents under normal and abnormal conditions. The diagnosis of cholecystitis or cholangitis was based on the presence of a large amount of cloudy, discoloured, heavy, mucoid bile containing desquamated epithelium, pus cells and bacteria. These observations in a large series of cases formed the basis of the so-called "Lyon test" for gall bladder disease. Lyon has also claimed considerable success by the use of lavage for the relief of catarrhal jaundice and chronic infections of the biliary tract. The authors have attempted by the study of a series of fifty cases to formulate conclusions on the success of this method and to discover its possibilities and limitations. It is pointed out that to establish the validity of the test and its therapeutic application various premises must be demonstrated: the presence of a functioning sphincter at the mouth of the common bile duct, rhythmic contraction of the gall bladder walls and simultaneous relaxation of the sphincter action at the papilla, both controlled by contrary acting systems of innervation, relaxation of the smooth muscle of the sphincter, caused by the application of magnesium salts to the duodenal mucosa, evidence that the fluid obtained was really gall bladder fluid and that changes in colour, consistency and amount indicated disease, evidence that cytological, chemical and bacteriological examination of this fluid was both possible and feasible and led to dependable conclusions regarding gall bladder pathology. As a result of a searching investigation of

these conditions the authors have concluded that whereas they had not succeeded in utilizing the diagnostic test of Lyon for the identification of chronic gall bladder disease, the subject appeared worthy of further consideration and investigation. In the treatment of incomplete obstructive jaundice due to calculus or new growth a freer flow of bile occurred after lavage than before it. In catarrhal jaundice the icterus disappeared within a reasonable time, but whether this was more rapidly than might have occurred otherwise, it was difficult to judge.

Wood Alcohol Toxaemia.

S. L. ZIEGLER (*New York State Journal of Medicine*, August, 1921) discusses the pathological effects produced by wood alcohol in human beings as a result of ingestion, inhalation and cutaneous absorption. He states that during the first six months of prohibition of alcohol in America there was a wood alcohol orgy, which caused an enormous number of sudden deaths and blindness. Methyl alcohol has been so refined that it looks, tastes and smells like grain alcohol. It is used in toilet waters, hair tonics, the arts and in many specially prepared forms as spirits. Various preparations have been sold by unscrupulous persons as beverages, the commonest form used being the "antifreeze" mixtures used for motor vehicles. A teaspoonful of the pure product has caused blindness and 30 c.cm. have caused death. The acute toxic symptoms are like those of grain alcohol poisoning. Blindness is usually noticed when the stupor wears off. Partial or complete recovery often occurs. The optic disc shows a neuroretinitis, retrobulbar neuritis or atrophy. The site of the lesion is not certain. It is thought that both the ganglion cells and the optic nerve fibres are injured. Chronic poisoning occurs in painters who inhale the fumes of wood alcohol and poisoning by cutaneous absorption from the application of toilet waters and liniments is not uncommon. The treatment recommended is gastric lavage with an alkali to empty the stomach and combat acidosis (which is a constant factor), followed by symptomatic treatment.

Preservation of Lemon Juice for Scurvy Prevention.

PERCY W. BASSETT SMITH (*The Lancet*, August 13, 1921) records further investigations with reference to the prevention of scurvy by the use of a dried preparation of lemon juice. The author refers to previous publications in which attention had been drawn to a method of making a portable and efficient dried preparation of lemon juice for use under conditions where dietary containing anti-scorbutic vitamins might be unobtainable. Further investigations have been undertaken to test these preparations after prolonged periods of storage. Experiments have been carried out by feeding guinea-pigs with tablets of lemon juice which had been stored in the

laboratory at room temperature for a period of one year. Control animals were fed under similar conditions without the supply of anti-scorbutic vitamin. It was found that the animals supplied with lemon juice tablets remained healthy, whereas the control animals developed scurvy after about three weeks. The author therefore claims to have demonstrated that tablets of lemon juice prepared in the cold have retained their efficiency as anti-scorbutics for a period longer than twelve months. Tinned tomatoes have also been found to be an efficient anti-scorbutic, both as a prophylactic and curative agent.

Salvarsan.

H. S. NEWMAN (*American Journal of the Medical Sciences*, October, 1921) records his views on the treatment of syphilis with salvarsan. He summarizes the results obtained by long continued administration of salvarsan. He previously reported the results of the administration of ten to forty-two doses of salvarsan to each of forty-six patients, including only one whose serum did not yield a Wassermann reaction. Pursuing the study of thirty of these patients for another two years, he now reports that in 63% the patient's serum did not yield a Wassermann reaction, in 13% the response was doubtful and in 27% the power to react persisted. Considering all these patients, he reports that they have had an average of 164 decigrammes of salvarsan over an average period of ninety-nine weeks. He concludes that 120 to 180 decigrammes of salvarsan should be administered to each syphilitic patient and that this dosage should be spread over one year in primary and secondary syphilis and over two to three years for patients with tertiary lesions. He considers that it is important to spread the treatment over a considerable time, as there is more likelihood of removing the power of the serum to react to the Wassermann test.

Salvarsan in General Paresis.

D. R. ROSS (*North-West Medicine*, August, 1921) gives a *résumé* of the results obtained in the treatment of general paresis with salvarsan. At the Oregon State Hospital treatment of forty patients suffering from paresis with intraspinal injections of salvarsanized serum was tried and it was concluded that the treatment did no good and was not without danger. During 1919-1920 114 sufferers from paresis at this hospital were treated with salvarsan or with salvarsan and mercury. The mercury appeared to make no difference one way or the other, but the author concludes that the treatment with salvarsan was not only useless, but was in some cases detrimental. In arriving at this conclusion, he compares the results of the treatment of these 114 patients with salvarsan with the results of treatment of 98 paretic patients during 1917-1918 with mercurials and iodides and finds that 58% of the latter and 70% of the former were not improved by treatment.

UROLOGY.

Chronic Pyelitis and Pyelo-Nephritis.

E. G. CRABTREE AND W. M. SNEDDEN (*Journal of Urology*, September, 1921) have investigated the causes of persistence of *Bacillus coli* pyelitis and pyelo-nephritis. There is a wide-spread belief that when the acute condition fails to be cured completely, it passes into the chronic stage and tends to persist in spite of all methods of treatment. The writers consider this view erroneous. The histories of thirty-four cured patients are analysed fully; in thirty-one they were checked by pyelograms. It is noted that quite often pyelo-nephritis is bilateral during the acute stage and yet persists in the chronic form as a unilateral infection. Where pyelograms have been made, it is seen that infection persists on the side showing evidence of stasis. The authors believe that colon bacillus pyelitis, with or without medical treatment, is either immediately or remotely self-limited, except in the presence of stasis. The more gross causes of stasis are stone, abnormal renal development and strictured ureter. Pyelographic study reveals that lesser degrees of stasis must be considered as important. Renal mobility and ptosis or sagging kidneys are the commonest causes of the lesser obstructions. In these conditions the outflow from the renal pelvis is obstructed for at least a part of the twenty-four hour period. If cystoscopy be performed soon after the patient has been up and about for some time, this pelvic retention can be demonstrated by the ureteric catheter. Pyelograms in the erect position demonstrate dilatation and angulation of the ureter. After the proper suspension by operation of the infected, sagging kidneys, symptoms may be relieved and a long-standing pyelitis cured. Study of chronic pyelitis persisting for over two years demonstrates the following: A gross renal damage (acquired) or abnormality (congenital) calling for surgical intervention, often nephrectomy, is present in about one-third of the patients. Renal stasis with lesser degree of pelvic change, usually due to renal abnormality, with or without sagging of the kidney and kinking of the ureter, is somewhat more frequent. In the remaining patients there is no apparent abnormality of the kidney or of the mechanics of drainage.

Cystoscopic Removal of Ureteric Calculus.

A. J. CROWELL (*Journal of Urology*, September, 1921) gives his results in the conservative treatment of ureteric calculus by means of ureteric dilatation. In the past six years the author has treated ninety-eight patients for ureteric calculus. An attempt was made to remove the calculi through the cystoscope in ninety-five. Success was obtained in eighty-eight. The method depends for success largely on good bladder and ureteric anaesthesia before dilatation. Thirty cubic centimetres of a 5% solution of procain acts on the floor of the bladder for ten minutes before the cystoscope is

inserted. The ureteric catheter is then inserted until it meets resistance. Procain is then injected and allowed to remain for ten minutes. The catheter can usually be passed above the stone, especially if oil is injected. The catheter is left in for twenty-four hours and then replaced by larger ones until No. 11 (French) is reached. The cystoscope is later passed over this catheter armed with another catheter, which is also inserted into the ureter. The metallic dilator of Bransford Lewis may be employed. Care should be taken not to push the stone back into the pelvis of the kidney. Before withdrawing the catheters, the kidney pelvis is distended with warm normal saline solution and finally a few drops of oil are injected. The method is safe, because the kidney is being drained all the time by the catheter. The renal function sometimes improves during the treatment. In some instances multiple stones and stones over 1.25 centimetres in the smallest diameter were successfully removed.

Perineal Removal of Ureteral Stone.

O. S. LOWSLEY (*Surgery, Gynecology and Obstetrics*, April, 1921) has devised a perineal operation for the removal of stones fixed in the lower four centimetres of the male ureter. The operation is on similar lines to that of seminal vesiculectomy. The ureter is found emerging just above the tip of the seminal vesicle. Access to this point is aided if the surgeon hooks a blunt-toothed retractor into the base of the prostate and pulls this gland forwards. The rectum is well separated from the seminal vesicles and the base of the bladder and is held back by means of a long narrow retractor. A tape is passed around the ureter just above the site of the stone and the duct incised over the stone. As it is almost impossible to suture the ureter, a cigarette drain is left in. The separated levatores ani muscles are drawn together by suture and the fat and skin are treated likewise. Considerable leakage of urine will take place for a few days and then cease. The patient may be allowed out of bed in a few days.

Primary Closure of Ureter and Renal Pelvis.

LE GRAND GUERRY (*Annals of Surgery*, July, 1921) maintains that in properly selected cases, after uretero- and pyelo-lithotomy, the duct may be completely closed and the wound sewn up without any drainage provision for urinary leakage. Closure may be effected in this manner, except when any of the following considerations are applicable: (i.) Stricture of the ureter which encroaches considerably on the lumen. (ii.) Presence of extensive infection. (iii.) Inaccessibility of the field of operation may render suture very difficult or impossible. (iv.) The patient's condition may be so serious as to make inadvisable anything but the minimum of manipulation. When the canal can be completely closed, the convalescence is shortened and the patient's comfort increased, while the mortality rate is

just as low. The sutures in the pelvis or ureter should not penetrate the mucosa and use should be made of the connective tissue and fatty capsules in reinforcing the suture line.

Pyelitis and Renal Calculi in Prostatics.

J. W. MARCHILDON AND HEIM (*Urologic and Cutaneous Review*, November, 1921) call attention to the frequency with which renal complications occur in persons affected with prostatic hypertrophy. These added complications are usually not investigated before operation and may be the cause of incomplete functional cure. Where the kidneys are heavily infected or renal calculi are present, the patient is apt to improve only very slowly after preliminary bladder drainage. He does not bear the enucleation well and is slow in convalescing. The renal infection is usually an ascending one from a cystitis following prolonged obstruction at the internal meatus. Renal radiography before prostatectomy should be used if calculi are suspected and pyelography is sometimes of value. Two illustrative cases of delayed recovery after prostatectomy are given. Complete cure was finally obtained, in one by nephrectomy for multiple calculi on one side, in the other by repeated pelvic lavage for bilateral pyelitis.

Fulguration for Prostatic Growths.

G. MACGOWAN (*Journal of Urology*, October, 1921) describes the use of the D'Arsonval diathermic current in the removal of five giant intra-vesical out-growths of the prostate. The cauterization is made through a supra-public approach and is particularly indicated when dangerous hæmorrhage would be expected from removal by enucleation. In three of the author's patients the trouble was a giant tumour of the prostate. In the other two it was a malignant growth of the bladder. The method is slow, but it is practically bloodless and eminently safe as long as the position of the point of the electrode is carefully watched. As the tissue is desiccated or cooked, it is snipped away with scissors. Further desiccation is then continued until the limits of the growth are passed. In malignant disease the capsule of the tumour should be sparked thoroughly and radium tubes left in for an appropriate time afterwards. The immediate and remote results in the five patients were good.

Prostatectomy.

J. A. GARDNER (*New York Medical Journal*, May, 1921) ardently advocates the two-stage suprapubic method of prostatectomy. Over 200 prostatectomies were done with but one death. Preliminary cystoscopy is important. The surgeon may thereby diagnose more perfectly the degree and nature of the prostatic enlargement. The suprapubic drain, put in at the first operation under local anaesthesia, is preferable to the in-dwelling catheter, which, in most cases, is poorly tolerated. The opening in the bladder should be high. A general anaesthetic is desirable for the prostatectomy.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Western Australian Branch of the British Medical Association was held at the Children's Hospital, Perth, on September 21, 1921, Dr. G. W. BARBER, C.B., C.M.G., D.S.O., the President, in the chair. The meeting was held at the invitation of Dr. R. S. MCGREGOR, D.S.O..

Demonstrations.

The members of the medical staff of the hospital presented a series of patients and discussed the clinical histories and diagnosis of each. Pathological and other specimens were also exhibited.

Enteric Fever.

Dr. R. S. MCGREGOR, D.S.O., read a short paper on enteric fever and its complications in children. He based his remarks on the experience gained in the hospital during the six months ended June 30, 1921. The number of patients admitted on account of enteric fever during this period was fifty-three. He divided the series into three groups:

The first group comprised forty-four patients. The diagnosis of enteric fever was based on the clinical signs and symptoms and on bacteriological or biological evidence. There was the usual history of malaise, headache, anorexia, prolonged fever and other symptoms. Rose spots were present. The spleen was enlarged. The serum yielded an agglutination reaction to the Widal test or *Bacilli typhosi* were isolated from the blood. The complications encountered in this group were as follows:

- (i.) *Otitis media* in ten patients. In three suppuration of the mastoid antrum developed. Operation was carried out. One patient died. The frequency of this complication was 19% of the whole series.
- (ii.) Pneumonia in six patients. The frequency was 11%.
- (iii.) Furunculosis in four patients. It was severe. The frequency was 7%.
- (iv.) Hæmorrhage in two patients. It was severe. The frequency was 3.8%.
- (v.) Pus in the antrum of Highmore and *cancrem oris* in one patient. This patient died.
- (vi.) Albuminuria in one patient.
- (vii.) Parotitis in one patient. Suppuration occurred and the pus was evacuated under chloroform anaesthesia.

The total number of deaths was four. The cause of death was heart failure in two. One patient died after an operation for mastoiditis and one died of *cancrem oris*.

The second group comprised one patient. The diagnosis of enteric fever was made on the clinical signs and symptoms. It was not confirmed bacteriologically. The serum did not agglutinate typhoid bacilli. No bacilli were recovered from the blood. The faeces and urine were not examined. The patient had fever for twenty days. Rose spots were present and the spleen was palpable. The temperature began to oscillate. There was no discharge from the ears, but some tenderness was noted over the mastoid process. The child died. At the *post mortem* examination thick pus was found in the mastoid cells.

The third group comprised eight patients. The diagnosis was based on bacteriological evidence, but there were no clinical signs of enteric fever. The patients were regarded as "carriers." There was no sustained fever. No rose spots were seen and the spleen was not enlarged. The Widal test yielded a reaction or *Bacillus typhosus* was found in the faeces or urine. The complications in this group were valvular disease of the heart and asthma. Before the patients were discharged from the hospital it was ascertained that the stools and urine were free from *Bacillus typhosus*. In the case of "carriers" calomel in small doses, salol and urotropine were given.

Dr. McGregor stated that he had not been able to find any records of the frequency of the various complications of enteric fever in the literature.

Pertussis Vaccine.

Dr. MCGREGOR gave an account of the treatment of pertussis with vaccine. The number of children treated in

this way was 344, of whom 319 were treated in the out-patient department and 25 in the wards. Among the former, nine were still whooping. The course of treatment consisted in giving six injections with an interval of four days between the injections. The initial dose was 100,000,000 bacilli. Of the nine children who had not responded to the first course, four had received a second course of six injections. Recovery took place in three. One child was still ill; the mother had taken the child away and had not returned. Three of the remaining five children had attended at intervals. The mothers had stated that they were cured. Two others had ceased their attendance.

The treatment was not complete in forty-nine children. Among the twenty-five children treated in the wards, the pertussis was complicated with broncho-pneumonia in fourteen. Three had died within six days of admission. Dr. McGregor suggested that the vaccine had not had sufficient time in these to produce any effect. He also stated that he had not observed any reaction in the form of a rise of temperature resulting from the injection of the vaccine. About fifty children had received one or two injections and had then ceased to attend at the hospital.

A discussion followed.

A MEETING of the Victorian Branch of the British Medical Association was held in the Pathological Lecture Room, Melbourne Hospital, on February 1, 1922, Dr. L. S. LATHAM, Vice-President, in the chair.

Hydatid Disease.

Dr. S. W. PATTERSON read a paper by Dr. N. HAMILTON FAIRLEY, O.B.E., on "The Complement Fixation Test for Hydatid Disease and its Clinical Value" (see page 341).

Dr. K. DOUGLAS FAIRLEY read a paper on "The Results of an Analysis of Thirty-Three Cases of Hydatid Disease of the Lung" (see page 346).

Dr. H. BOYD GRAHAM said that when Dr. N. Hamilton Fairley was carrying out his recent research at the Walter and Eliza Hall Institute on complement fixation in hydatid disease, blood specimens of several patients were sent to him from the Children's Hospital, Melbourne. The frequency with which the serum of patients failed to fix complement in the presence of the hydatid antigen, although these patients were shown to be suffering from the disease, was perplexing in view of the uniformity with which reactions were obtained with the serum of adult patients. It would seem to be desirable to inquire further into possible differences between the manifestations of this disease in children and in adults. With this object in view the speaker examined the case records available at the Children's Hospital.

In the twelve years, 1910 to 1921 inclusive, forty-one patients had been admitted for the first time and eleven of these had subsequently been re-admitted. In five other patients hydatid disease had been diagnosed, but the evidence was not conclusive. This meant that in each year there were three or four patients admitted for the first time and one re-admitted. Of the forty-one patients, twenty-three came from the country and eighteen from the city and suburbs. Twenty of the patients were male and twenty-one were female. The average age on admission was eight years. The age of the youngest child was three and a half years, while the commonest ages were six and seven years. Of the forty-one patients, thirty-one had had one cyst only so far as had been ascertained. Thirty-seven had had one cyst only on admission. Of the cysts, twenty-three were hepatic, twelve were pulmonary and only two were in other sites. Four patients had had two cysts; in three they were both in the liver and in the fourth they were both in the spine. It would appear that children with hydatid disease were about twice as liable to have pulmonary cysts as were adult subjects.

In the past twenty-two years at the Children's Hospital, 118 cysts had been localized, as follows: Liver, 71, lungs, 36 (30%); elsewhere, 11. Griffiths had estimated for adults that the pulmonary incidence was 10% to 15% and this was borne out by Dr. Keith Fairley's Melbourne Hospital figures. During twenty-two years there had been eleven cysts situated elsewhere than in the lungs or liver. They had occurred in the abdominal wall, in the omentum,

in the pelvis, in the left kidney, in the brain, in the femur, in the ribs and in the spine. There had been examples of retrogression or suppuration of cysts, but none of calcification. Daughter cysts had rarely been seen. They had been present on four occasions only during the past twelve years, according to the records. Free hooklets had been specially looked for in fifteen cysts. They were only found in four; in two of these daughter cysts had been present. Scolices had been seen twice only; daughter cysts had been present in one instance.

Thirteen patients had had a sharp rise of temperature with a quick and sustained fall within twenty-four hours or so of operation or rupture of the cyst. Four others had had a wide-spread urticarial eruption within a few days after the cyst was opened. Two patients had suffered from severe cardiac depression on the operation table and one other died within a few hours of operation.

Eosinophilia of over 5% had been found in five out of thirteen patients in which it was looked for.

Only four of the forty-one children had died. In each of the fatal cases there had been other indications that would have gravely modified the prognosis. One patient was a congenital syphilitic with a very large cyst; another had a large hydatid of the left kidney diagnosed before operation. A third was a very young child with a very large cyst and laminectomy had been performed in the fourth.

Dr. R. J. BULL said that he wished to express his appreciation of the excellent paper compiled by Dr. Keith Fairley from his close analysis of the records of a series of patients with pulmonary hydatid disease. The work of Dr. Hamilton Fairley on the complement fixation test in hydatid disease was of the very highest order and from it he was convinced that the complement fixation reaction in cases of suspected hydatid infestation was a very valuable aid to diagnosis.

He was in complete agreement with Dr. Keith Fairley on the point that all difficult and obscure pulmonary conditions, particularly in Australia, should be investigated from the point of view of the possible presence of an hydatid cyst.

He had been interested in the comparative failure of the complement fixation reaction in children as shown by Dr. Hamilton Fairley's observations. The remarks of Dr. Graham concerning the relative infrequency with which daughter cysts, scolices and hooklets were found in the hydatid cysts of children were also of importance. He recollected examining some years previously a specimen of sputum sent to the University Laboratory from a child in the Children's Hospital suspected of pulmonary tuberculosis. In carrying out the usual Ziehl-Neelsen examination, he had encountered very numerous hydatid hooklets, but that was an exceptional experience and he could not recall a similar instance.

Dr. Hamilton Fairley had shown that the intensity of the complement fixation reaction in hydatid disease varied with the facility with which antigen was liberated and absorbed. He also pointed out that in many instances no reaction occurred in children before operation. It had occurred to him (the speaker) that the explanation of the varying phenomena in the adult and the child might lie in the relative rates of growth of the parasitic cyst and the tissues of the host. In the child growth was proceeding actively in both cyst and tissues of the affected organ. In the adult the tissues were stationary, while growth advanced in the cyst. Possibly in the child a condition of equilibrium was established in which there was little absorption of antigen and the more settled tissues of the adult offered greater opportunity for absorption of the antigen or substance exciting the serological response.

In conclusion, Dr. Bull commented upon the great advances in exact laboratory methods and the place they should occupy in the university training of medical students. There could be no question but that students should be conversant with the various laboratory aids to diagnosis, but if these were given too great prominence in the curriculum, the student would be in danger of failing to acquire and develop that very essential quality, the clinical sense.

Dr. Bull related two interesting anecdotes concerning multiple hydatid cysts in the omentum and a multi-locular

hydatid cyst of the femur simulating periosteal sarcoma, in which the successful application of keen clinical observation was well illustrated.

Dr. E. H. MOLESWORTH said that he had been greatly impressed with the care and accuracy with which Dr. Keith Fairley had studied his series of cases of pulmonary hydatid disease. The methods of Dr. Hamilton Fairley evoked his highest admiration and he sought information upon the point of how a regular supply of antigen might be secured. Was it necessary to send to the *abattoirs* at frequent intervals for fresh antigen or was the prepared antigen capable of being stored in the ice-chest for any considerable period without deteriorating?

From Dr. Hamilton Fairley's work they had learned that the most efficient antigen was hydatid fluid, in which scolices were numerous or to which an extract of scolices had been added. Dr. Graham had provided interesting details relating to the comparative scarcity of scolices and daughter cysts in the hydatid fluids obtained from children. As the antigenic power seemed to depend in some measure on the presence of scolices, it appeared probable that the frequent absence of scolices in the hydatid cysts of children was the underlying factor in the poor response observed in children to the complement fixation test.

Dr. S. V. SEWELL outlined the history of a patient referred to him recently in which the value of the complement fixation reaction in hydatid disease was strikingly demonstrated. The patient had suffered three hæmoptyses within six months and a steady decline in weight and strength had been noted. Physical examination disclosed an area of consolidation in the right inter-scapular region which fell a little short of the apex of the lung. The radiographic examination was confirmatory, in that it showed a more or less circular consolidation from which foci of diffuse shadow radiated. There was a persistent slight fever. Although no tubercle bacilli could be found in the sputum, he was strongly disposed towards a diagnosis of tuberculosis. A specimen of blood was sent to the Walter and Eliza Hall Institute for investigation of the complement fixation power of the serum in regard to hydatid; a reaction was obtained. On the day following the receipt of the report the patient coughed up several hydatid cysts.

Dr. Keith Fairley had rightly insisted upon the importance of bearing hydatid in mind when the clinician was confronted with an obscure pulmonary condition. Dr. Sewell wished to express his appreciation of his very able paper.

Dr. H. DOUGLAS STEPHENS related two instances in children in which the complement fixation reaction for hydatid could not be demonstrated.

The first child, aged ten, was sent to him with a history of hæmoptysis of recent date; tubercle bacilli had been found in the sputum. The child was thin and pale and the clinical signs were consistent with hilus tuberculosis of the left lung or a deep-seated pulmonary hydatid. The evidence obtained from the X-ray examination was more in favour of the former than of the latter. No complement fixation with the hydatid antigen was obtained. Repeated examination of the sputum failed to confirm the former finding of tubercle bacilli, nor could any hydatid hooklets be demonstrated. A few months later the boy had a profuse hæmoptysis and coughed up several hydatid cysts.

The second child, aged twenty-one months, was the youngest patient with hydatid disease of whom he had heard. The beginning of the illness was a pneumonic condition which persisted for three to four months. When he first saw the child, he was thin, pallid and afebrile. The conspicuous physical signs were dulness and tubular breathing at the base of the left lung. The X-ray examination had indicated a hydatid cyst in the basal portion of the left lung and a second cyst in the right upper lobe. He had operated upon the child, dealing with each cyst at a separate operation, but, unfortunately, before the child had been brought back for the second operation, infection of the remaining cyst, that at the left base, had occurred. After death he had been enabled to demonstrate what he had suspected clinically, the presence of a third cyst in the liver. In this child the complement fixation test for hydatid disease had repeatedly failed to yield a reaction. Although the boy was only twenty-one months old, it

seemed probable that he had harboured an hydatid cyst for three to four months.

In conclusion, Dr. Stephens expressed the hope that some means would be devised of stimulating the reaction in children, as experience hitherto, at least prior to operation, had been disappointing. In both instances which he had quoted, the obtaining of a reaction would have been of the greatest assistance.

Dr. J. NEWMAN MORRIS remarked that Dr. Keith Fairley's contribution to the clinical aspects of pulmonary hydatid disease should prove extremely helpful. He had been very much impressed with Dr. Fairley's warning to keep hydatid in mind when endeavouring to elucidate clinically a pathological condition of the chest.

He would be interested to hear the experience of men who had practised in country districts where hydatid disease was common and would like to hear some expressions of opinion regarding the risk attaching to the use of the exploring needle in cases of pulmonary hydatid. All were aware of the teaching that an hydatid cyst in the lung should not be aspirated unless the practitioner were prepared to proceed with operation. At the same time, of three pulmonary hydatid cysts which he could recollect, two were diagnosed by the use of the exploring needle. In one of these exploration had been employed to verify or otherwise the strong clinical suspicion of pneumonia and empyema, but clear fluid, subsequently shown to contain hydatid hooklets, had been withdrawn. He would like to hear the views of others as to the actual risk attending the use of exploratory puncture in hydatid of the lung.

Dr. C. E. DENNIS quoted an instance in which a test such as the complement fixation would have been extremely valuable had it been possible to apply it.

Some years ago, following the installation of an X-ray apparatus in a certain hospital, he had asked that a patient with advanced pulmonary tuberculosis should be sent along for demonstration purposes. In the patient chosen emaciation had proceeded to a severe degree. There had been many hæmorrhages. His condition was particularly suitable for the demonstration. The radiographic appearances, however, were not those of tuberculosis. An irregular mass below the clavicle and to the right of the heart led him to suspect malignant disease of the lung or hydatid disease. From the results obtained by Dr. Hamilton Fairley, it seemed extremely probable that, in the event of this patient being affected with hydatid disease, his serum would have deflected complement in the presence of the hydatid antigen.

Dr. J. RAYMOND FOX spoke as having practised for twenty years in the district of Stawell, Victoria, where echinococcus disease was very common. From his notes he found that in every family living along a certain creek hydatid disease had occurred in one or more members.

From his clinical experience he could support the principles advocated by Dr. Keith Fairley in the diagnosis of hydatid disease of the lung. He had been impressed with the very great value of the work of Dr. Hamilton Fairley on complement fixation.

In the application of this test difficulty seemed to have arisen among children and in those adult patients in whom the cysts were firm-walled and calcified. He had found calcification of the cyst wall and a tendency to recur of frequent occurrence in omental hydatids. The failure of antigen to permeate the calcified cyst wall and to evoke a serological response seemed a very rational explanation of the failure to obtain a response to the complement fixation test.

His own experience was in accord with the findings of Dr. Graham relative to hydatid cysts in children, that cysts in young subjects were frequently free of daughter cysts and scolices. If, as it had appeared, scolices were the chief source of antigen, the frequent failure of children to react to the complement fixation test probably depended on the absence of scolices from the cyst. It was possible also that the time factor entered in and that in the child the hydatid cysts provoked symptoms and recognition before sufficient time had elapsed for the development within them of the antibodies.

Dr. Fox related some details of an interesting condition of a patient who had consulted him on account of pain

localized over the spleen. He had suspected caries of the spine, but at operation had discovered a suppurating hydatid of the lung from which quantities of daughter cysts were being evacuated. Two years later pain had recurred and he had found a small spicule of bone in the scar of the former operation. Twelve months later still the patient had suffered further pain in the left hypochondrium and on this occasion he had removed an hydatid cyst of the size of a walnut. It was apparent that it had taken twelve months to attain that size.

Undoubtedly the use of the needle in hydatid of the lung was something of a bugbear, but he could say that he would have frequently failed to establish the diagnosis without the use of the aspirating needle. He had never made an exploratory puncture without being prepared to go on with the operation.

In conclusion, Dr. Fox said that perhaps the greatest benefit that would be derived from the complement fixation reaction lay in its prognostic significance, especially where hydatid cysts were found in serous membranes, a site in which they were very prone to recur.

Dr. S. V. SEWELL described an alarming experience of the use of the exploring syringe in a patient with hydatid of the lung. The air passages had been flooded and it was only by the most energetic measures that a catastrophe had been avoided.

Mr. ATHOL TYMMS said that in the interpretation of the prognostic significance of the complement fixation reaction he understood that a strong positive reaction generally followed operative interference. The response then gradually subsided and a failure to react after twelve months was to be taken as an indication that all the cysts had been extirpated. He quoted details of two patients, one a woman, who had undergone an operation for abdominal hydatids ten years before and from whom within the last two years he had removed two calcified hydatids from the omentum. No complement fixation reaction had been obtained a year after the second operation and it would be interesting to note if the subsequent course of this woman verified the inference to be drawn from this fact.

In the second patient no complement fixation had been obtained two years after operation, although at the time there were good clinical grounds for believing that all the cysts had not been removed.

Dr. L. S. LATHAM conveyed the appreciation of all present to the readers of the papers. He was impressed with Dr. Keith Fairley's careful scrutiny of a series of cases of pulmonary hydatid disease and paid a tribute to the masterly work of Dr. Hamilton Fairley on the complement fixation reaction in hydatid disease. In one way after another light was being thrown on the diagnostic difficulties of medicine and in this direction the workers at the Walter and Eliza Hall Institute had contributed in no small manner.

Dr. KEITH FAIRLEY, in reply, said that he had been very interested to note from the figures supplied by Dr. Graham that in 33% of hydatid infestations in children cysts were found in the lung. He (Dr. Fairley) had studied the records of 260 adult patients with hydatid disease in the Melbourne Hospital and had found that cysts were located in the lung in 13%. These figures seemed to support the suggestion he had made in his paper that the embryo might reach the lung by direct boring from the liver, where it arrived by ingestion through the alimentary tract. The shorter distance from liver to lung than the embryo would have to traverse in the child, might account for the relatively higher incidence of pulmonary cysts in children.

With reference to the question of exploration by needling an hydatid cyst in the lung, the instance quoted by Dr. Sewell abundantly demonstrated the risks attaching to such procedure. At the present time it was not justifiable to explore by aspiration a suspected hydatid of the lung without a report on the result of the complement fixation test.

Dr. S. W. PATTERSON said that it was at present the practice to obtain antigen from the *abattoirs* weekly. Although it would keep on ice, it was frequently contaminated by bacteria, so that it was necessary to obtain a fresh supply every week.

Since Dr. Hamilton Fairley commenced to work on the complement fixation test in hydatid infestation he had effected considerable improvement in the potency of the antigen. Dr. Fairley had first shown the influence of scolices in this direction and at the Walter and Eliza Hall Institute they were still working towards the objective of obtaining a stable and permanent antigen.

In seeking for an explanation of the poor response observed in children to the complement fixation test, it was to be remembered that hydatid fluid obtained at operation from children which failed to yield a reaction prior to operation, was shown to be "antigenic" when tried in the test with known positive sera. The proportion of positive results became very much higher as the patients reached adult age and it appeared that the repeated small insults of life to the tissues promoted the absorption of antigen and the consequent development of the complement fixation reaction in the blood serum.

A MEETING of the Victorian Branch of the British Medical Association was held in the Medical Society Hall on February 24, 1922. Dr. L. S. LATHAM, the Vice-President, occupied the chair.

Psychology.

PROFESSOR ELTON MAYO, of the University of Brisbane, delivered an address on "Psychology in Relation to Psycho-Analysis and Applied Psychology." He covered a very wide field in the two hours for which he held the attention of the audience. He discussed psychology as a science and indicated how it was linked up with biology and physiology.

In tracing the road psychological research had taken, Professor Mayo separated the psychology of the university from the researches in medical psychology. The pioneer in the former school, which concerned itself with the process of thinking, the mental foreground, was Locke. The work in the latter field, the mental hinterland, had been carried on almost entirely by medical men and prominent among them were Janet, Binet and Charcot.

The lecturer dealt at some length with the contributions of the Salpêtrière school and passed on to review and comment on the theories and concepts of Freud, their influence on psychic thought, research and methods.

While dissociating himself from the complete acceptance of the Freudian doctrine, which would attribute all psycho-neuroses to sex repression, Professor Mayo emphasized that very great value was to be attached to the work of Freud, in that it had supplied psycho-analysts with an extremely useful technique and a valuable method by which to pursue their inquiries.

Dr. R. R. STAWELL, in moving a vote of thanks to the lecturer, expressed great appreciation of the address, the subject of which was so closely linked up with the practice of medicine.

Dr. J. W. SPRINGTHORPE seconded the vote of thanks.

There was a brief discussion.

Dr. W. ERNEST JONES urged that psychology should be introduced into the medical curriculum.

Dr. R. C. WITHERINGTON, Dr. W. OSTERMEYER, Dr. PAUL DANE and Dr. A. L. KENNY also took part.

The vote of thanks was cordially received and carried by acclamation.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for election as a member of the New South Wales Branch of the British Medical Association:

LOGAN, CEDRIC JAMES, M.B., Mast. Surg., 1921 (Univ. Sydney), Sydney Hospital.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

DONALDSON, JAMES BLAIR, L.R.C.P. et S. (Edin.), L.R.F.P.S. (Glasg.), 1913, Linton.

TOWNSEND, RUBY ADELE, M.B., B.S., 1921 (Univ. Melb.), Queen Victoria Hospital, Melbourne.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

At a meeting of the Senate of the University of Sydney held on March 6, 1922, the degree of Master of Surgery (Ch.M.) was conferred upon R. B. MINNETT, M.B., in absentia.

The following appointments were made:

Half-Time Demonstrators in Physiology: HILDA KINCAID, D.Sc. (Melb.), M.B., B.S. (Melb.); J. H. BENDEICH, B.A., M.B., Ch.M.; S. J. H. MOREAU, M.B., Ch.M.; LORNA D. BEVERIDGE, M.B., Ch.M., B.Sc.

Acting Lecturer in Psychological Medicine for 1922: Dr. S. EVAN JONES.

Lecturer in Veterinary Materia Medica and Pharmacy: C. J. M. WALTERS, B.V.Sc. (re-appointed).

Demonstrator in Organic Chemistry: E. HURST, B.Sc. (re-appointed).

Part-Time Demonstrators in Anatomy: Dr. J. C. STOREY, Dr. E. H. FISHER, Dr. R. J. SILVERTON, Dr. RUTHERFORD DARLING, Dr. L. G. TEECE, Dr. B. T. EDYE, Dr. C. WASSALL, Dr. E. P. DARR, Dr. C. L. CHAPMAN.

Honorary Demonstrators in Anatomy: Dr. H. R. G. POATE, Dr. S. SCOUALL, Dr. S. LIGHTOLLER, Dr. R. P. FRANCIS, Dr. N. D. ROYLE, Dr. A. L. BUCHANAN, Dr. LORNA BEVERIDGE, Dr. V. M. COPPLESON, Dr. A. PURVES, Dr. T. Y. NELSON.

On the recommendation of the Finance Committee it was decided to adopt the plans of the extension of the Union Building in accordance with the report of the Building Committee.

A letter was received from the Bursary Endowment Board, reporting that in connexion with the Anzac Memorial Appeal, 1919, a bursary of £25 per annum, tenable for not more than five years at the University, had been donated by Mr. and Mrs. John Sulman. The award is intended to assist the son or daughter of a soldier who lost his life in the late war to follow a course in one of the faculties of the University and one of the conditions of the award will be that the winner shall undertake to continue at the University long enough to complete the course taken up. It was decided to bring the matter under the notice of students.

It was decided to join with other Australian Universities in inviting Professor Einstein to Australia, as the Professor is visiting Java in connexion with solar eclipse observations.

UNIVERSITY OF WESTERN AUSTRALIA.

It is announced that Dr. ATHELSTAN JOHN H. SAW, M.L.C., has been elected Chancellor of the University of Western Australia, in succession to Archbishop Riley, who has recently retired. We offer our congratulations to Dr. Saw on his appointment to this important office and to the medical profession on the occasion of the selection of one of its members to clothe the chief seat in the foremost educational institution in the western State.

WARREN TRIENNIAL PRIZE.

THE GENERAL EXECUTIVE COMMITTEE OF THE MASSACHUSETTS GENERAL HOSPITAL announces that the Warren Triennial Prize will be awarded for the best dissertation considered worthy on any subject in physiology, surgery or pathological anatomy submitted on or before April 15, 1922. The thesis must be in either, English, French or German and must be typewritten and suitably bound so as to be easily handled. Work that has been published previously will not be considered. The name of the writer must be enclosed in a sealed envelope, on which must be written a motto corresponding with that on the accompanying dissertation. The value of the prize for 1911 will be five hundred dollars.

Correspondence.

LEAD POISONING AMONG QUEENSLAND CHILDREN.

SIR: It must be apparent to your readers that Dr. S. A. Smith has not answered the criticisms of the Council of the Queensland Branch of the British Medical Association. The Council quoted his actual words and accused him (i.) of giving in a very positive manner erroneous evidence on a matter of which he had no first-hand knowledge, (ii.) of having failed to read or failed to understand the evidence already published, (iii.) of having given self-contradictory evidence on a very important point, (iv.) of having displayed an exaggerated opinion of his own standing as a scientific member of our profession. Instead of meeting these charges, Dr. Smith has preferred to make an attack on Dr. Gibson and myself. As one of those attacked, I presume I shall be allowed to reply.

Dr. Smith is careful to state that he does not contend that all the cases we describe are not cases of lead poisoning. He is also careful not to admit that any of them are such. Still more carefully does he refrain from indicating what points, if any, in the limb palsies, colics and anæmias, which constitute 75% of our cases, are inconsistent with this diagnosis, or what further evidence he requires. His caution, or shall we say his want of candour, is conspicuous. To the Brisbane practitioner, to whom cases of lead poisoning in children are part of the daily routine, Dr. Smith's attitude appears ridiculous. If he had been present at a recent demonstration at our Children's Hospital, we could have shown him more cases of lead poisoning in childhood than he has ever seen or is ever likely to see in all his life. He might have seen eleven cases of foot-drop or wrist-drop or both combined, some with histories of colic, most of them anæmic, as shown by red cell and hæmoglobin estimations, all with basophilia of the red cells, some with blue line on gums, most of them with evidence of renal irritation. One of these paralytic cases had had a recent attack of papilloedema. A twelfth case had papilloedema with transient paralysis of a sixth nerve, a plain blue line on gums, red cell basophilia and lead had been found in her urine by the Government Analyst.

These ocular cases are more difficult of diagnosis than those of limb palsy of the peripheral neuritis type. They comprise some 25% of our cases and though I should like very much to discuss them at length, I must leave that to Dr. Gibson. I must point out that our case for prophylaxis rests quite securely on the 75% of our cases that Dr. Smith refuses to discuss. Why some cases should suffer in their cranial nerves only and others in their limb nerves is a difficult problem; possibly idiosyncrasy has something to do with it, but I suspect dosage plays a part. Some cases ingest comparatively much lead in a comparatively short time; in others the amount is smaller and the period of exposure longer. I offer this as a suggestion. I also suggest that the symptoms of plumbism in childhood may not be exactly the same as in adult ages. Where, as in Brisbane, peripheral lead palsy is common, some cases of cranial nerve plumbism are likely to occur; our opportunities of seeing them are exceptional. An isolated case occurring elsewhere is almost sure to be attributed to some other cause, as by myself in the first four cases recognized as a definite clinical complex. I can inform Dr. Smith that the cerebro-spinal fluid is under pressure, that it is perfectly clear, that it is bacteriologically sterile and that it has been microscopically examined; but I will leave it to those who have made the examinations to give the results in detail. So far as I know, the blood has not been examined for bacteria, nor has the cerebro-spinal fluid been injected into guinea-pigs. Dr. Smith will always be able to point out something that we have not done.

Dr. Smith says that the fæces have not been examined for lead. Breinl and Young examined them repeatedly in sixteen cases and found measurable quantities of lead in every one.

He also says that the presence of a blue line on the gums and of lead in the urine are signs of lead absorption, not of lead poisoning. This is such an elementary truth

that it hardly needs statement. Nevertheless, the presence of lead in the urine, when combined with symptoms, may be diagnostic. We have seen a blue line on the gums in the absence of symptoms and I have no doubt that if sufficient search be made some children without symptoms will be found to be passing lead in the urine; indeed, Breinl and Young have recorded three such cases. That such cases would be common, as Dr. Smith assumes, remains to be proved. It is unsafe to assume that children have the same and not a greater susceptibility to lead than adults. In any case, chemical analyses have proved the existence of lead absorption among Queensland children; a perilous condition, which should much disturb those interested in public health.

When Dr. Smith declares that the failure of Breinl and Young to find lead in the urine of healthy children living under the same conditions as those suffering from lead poisoning tends to disprove our theory as to the source of the poison, he presumes too much. Of six children playing on one verandah among powdery paint, it does not necessarily happen that all or any will get lead into their stomachs. He knows very well that we have tried to show why this is so. He wants to know how much carbonate of lead these children get on their hands. By rubbing weathered verandah railings I can get the palms of my hands covered with white powder in two minutes. How much a child of three or four years may get on its hands in six months, is a question I cannot answer. It would be very interesting if some patient observer would try to make a correct estimate.

Dr. Smith in his evidence did not express doubt as to the children being poisoned by lead paint. He expressed flat disbelief. He roundly declared that it was impossible. His evidence gave much pleasure to those interested in lead paint. Apparently he did not foresee that it would gravely displease those interested in the health of children. Nor does it seem to have occurred to him that mental blindness in a scientific expert in Sydney is a potential cause of actual physical blindness in Brisbane.

Yours, etc.,

A. JEFFERIS TURNER.

Wickham Terrace, Brisbane,
March 15, 1922.

SIR: The Council of the Queensland Branch has made an endeavour in the interests of preventive medicine to counteract the possibly evil effect on impending legislation of Dr. S. A. Smith's evidence.

It was evident that he did not preserve an open mind with regard to our cases of lead poisoning and that his was a closed mind with regard to the source of the poisoning. His letter proves this. It, like his evidence, will be made use of by white lead manufacturers and master painters in their endeavour to prevent the legislation we hope for. It can be called quite a clever (considering how bad his case was) piece of special pleading. It can only, I hope, be accounted for by concluding that he has not read our papers "with brains, Sir," if he has read some of them at all. Readers of Dr. John Brown's "*Horæ Subsecivæ*" will recognize that this remark was originally called forth on a question of paint.

I may say at starting that I am quite satisfied to have Jefferis Turner associated with me in the matter.

It really is not necessary after the Council's communications to traverse Dr. S. A. Smith's letter in detail. Some of his quotations from my papers help my answer. I hold to every word of those quoted. Two or three of them, however, have been so deprived of their content as to make them appear mere bald statements with nothing behind them. For instance, I did not baldly say that the finding of lead in the urine was "absolutely diagnostic of lead poisoning." Our contention has been, very clearly, that, given a patient with symptoms attributable to lead, the finding of lead in the urine would clinch the diagnosis. I have always held the belief that the finding of lead in the fæces would prove only that it had entered the intestinal canal.

By the way, for at least two years the ocular plumbic cases have had their blood examined and it has constantly shown coarse punctate basophilia. I did not find it neces-

sary to have the blood examined except occasionally before. It has given us useful confirmation of our diagnoses.

The cerebro-spinal fluid has always been clear and on the few occasions it has been examined for organisms, it has been found to be sterile.

Dr. Smith's strangest attitude is perhaps with regard to his proposed method of disproving what he calls the "verandah railing theory." He misinterprets Breinl and Young's observations. They examined the urines of healthy children in the same locality, not to disprove the diagnostic value of the presence of lead in the lead poisoning cases, but to prove that value. Curiously enough, they found lead in three cases exposed to lead absorption, but showing no symptoms. This we would expect. The urine of a fourth child was also examined and no lead was found. It lent confirmation to my "theory" by being an infant in arms. These cases have not been quoted by Dr. Smith. Had Breinl and Young failed to find lead in the urine of young children exposed to powdered lead on verandah railings and who possessed two habits, *viz.*, those of handling the railings and biting their nails or of sucking their fingers, it would have weighed, though not conclusively, against our evidence of the source of the poison. But if a number of healthy or affected children who did not bite their nails or suck their fingers and who were not exposed to powdery paint, had yielded lead in their urine, it would mean that our explanation of the source of the poison would not hold water.

I am satisfied that a perusal of our papers with attention and following a perusal of the Branch Council's two communications, will convince any physician or ophthalmologist I would care to convince of the soundness of our premisses.

If we achieve our object and abolish white lead from painted surfaces within the reach of young children, these cases will become things of the past.

It should be remembered that the diagnosis of plumbism was established in our cases many years before we knew the source of the poison.

Breinl and Young's paper contains this significant sentence: "It is striking that cases similar to those described above should not have been recorded from other parts of the tropics where lead paint is employed. Whether this is due to local conditions prevalent in Queensland only, to the difficulty of diagnosis or to the lack of a definite clue associating such symptoms with lead, remains to be seen."

This paragraph really applies to the ordinary paralytic lead cases which, we think, any medical man should be able to diagnose from clinical symptoms alone. It shows how necessary it was for me to point out, if I was to help other medical men, the difficulty of diagnosing the ocular plumbic cases unless they are compared with those I have described. Dr. Smith has quoted this against me.

Even the best physicians and ophthalmologists would not only, otherwise, fail to diagnose an isolated case as due to lead poisoning in a young child; lead poisoning would not even be considered. This is my opinion, but it is not unsupported by cases in point. As a matter of fact, although I saw with Jefferis Turner the first cases described by him as benign meningitis, I did not think of lead. When I took on the eye work at the Children's Hospital in 1895 the prevalence of the wrist-drop and foot-drop cases suggested lead to me as a cause of the ocular ones. I had their urines examined and lead was found by the Government Analyst. Why these cases should so seldom have wrist-drop and foot-drop symptoms to help the diagnostician is remarkable. Fortunately, the recent paralytic squint leads the parents as a rule to take note and seek for early advice. Dr. S. A. Smith's arguments that the ocular cases have been described in no other part of the world is an argument applicable to any new knowledge and Breinl's and Young's explanation may be urged with special insistence.

Regarding cases of lead absorption not necessarily showing symptoms of lead poisoning, I have referred to this over and over again; I have even suggested that they are subjects of potential lead poisoning, the lead ready to become active on some key adjustment which we do not at present understand. In speaking to our Professor of Chemistry, B. D. Steele, F.R.S., on the question of deionization for lead cases and on the conflicting evidence

regarding its value, I was interested and heartened to find that he can furnish a possible explanation. He says it depends entirely upon whether the lead in the tissues exists in a colloid form or crystalloid form. If colloid electrolysis would not be expected to result in its removal and deposit on the negative electrode, nor would one expect to find lead in the urine of such a case. If crystalloid electrolysis would remove it and might even be expected to remove a lead blue line (if not colloid) from the gums.

This, indeed, he allows me to say, may be the explanation of why lead workers and our children may establish what has been called a tolerance for lead. The lead really having assumed a colloid form and being consequently in a sense encysted in the tissues. It is at least an interesting hypothesis.

We have not latterly urged idiosyncrasy in the case of our patients, because they can obtain any quantity of lead. Had we needed to urge this, Oliver's pregnant women lead workers would furnish it. These women, though exhibiting themselves no symptoms of lead poisoning, either abort or have children who die just after birth of lead poisoning and in their internal organs lead is found. Dr. S. A. Smith may claim that the finding of lead in the internal organs of these infants is no proof that they died of lead poisoning! He will at least admit that it could only get into the babies by diffusion from the maternal blood.

Yours, etc.,

J. LOCKHART GIBSON.

March 15, 1922.

SIR: Dr. S. A. Smith, in his letter on plumbism which appeared in THE MEDICAL JOURNAL OF AUSTRALIA (March 11, 1922), states that he is merely answering Drs. Lockhart Gibson and Jefferis Turner and not the Council of the Queensland Branch.

In contradiction of this statement, may I quote from the account of a clinical meeting at the Hospital for Sick Children on January 26 last. A number of cases of lead poisoning were shown and at the same time a number of cases of anterior poliomyelitis.

One speaker after another discussed the cases shown and the most important speeches were made by Dr. Graham Butler and Dr. Gifford Croll, both members of the Council. Both accepted the work of Drs. Gibson and Turner in its entirety and paid special tributes to the value of the theory in treatment.

It would add much point to the present discussion if the proceedings of this meeting were published at once, so that your readers in the south might have actual evidence of the way in which the views of Drs. Turner and Gibson are received by their colleagues in Brisbane and neighbouring towns.

In short, the sense of the meeting was: If the disease is not lead poisoning, what is it? If it is not acquired from painted surfaces *via* sucked and bitten fingers, how is it acquired?

Finally, Dr. Smith states that the excretion of lead in the urine is not a pathognomonic sign of lead intoxication. I agree. The excretion of typhoid bacilli in the urine is not a pathognomonic sign of typhoid fever, but if, then, we find that the patient has delirium, fever, an enlarged spleen and rose spots, we generally assume it to be so. When in a child excreting lead we find colic, anæmia, basophilia, paralysis and occasionally a blue line, may we not assume that lead intoxication is present?

Yours, etc.,

S. F. McDONALD, M.D., M.R.C.P.

Honorary Secretary, Children's Hospital Clinical Society.
Brisbane, March 13, 1922.

SIR: Dr. S. A. Smith, in THE MEDICAL JOURNAL OF AUSTRALIA, March 11, 1922, says he is convinced that he has to answer not the Council of the Queensland Branch, but Drs. Lockhart Gibson and Jefferis Turner.

Drs. Gibson and Turner are not now active members of the honorary staff of this hospital and Dr. Turner is not a member of the Council of the Branch. But five members

of this Board are members of the Council and have been awaiting his reply.

Now his reply has come and, we regret to say, is very barren of helpful suggestion.

We have before us at present in the hospital seventeen cases diagnosed as lead poisoning. The majority are classical in the clinical picture and could not well be mistaken for anything else. We know that they all have soluble carbonate of lead available in large quantities in their homes and the majority, in fact practically all of them, suck their fingers and bite their nails. We know from past experience that if they are allowed to return to those homes without the lead being removed and continue to bite their nails, many of them will return with a fresh attack; but if the lead is removed and the objectionable habit stopped, they will not.

Now Dr. S. A. Smith asks us to doubt in the first place if these cases are lead poisoning and to doubt in the second place if that very apparent source of the poison is the true source. He does not, however, offer any suggestion as to what these cases may be if they are not lead and, if they are lead, he does not suggest any other possible source of the poison than the one in question.

Drs. Gibson and Turner have given us a very reasonable theory to account for these cases: a theory which, when applied, gives good results both in prevention and cure. There are gaps in the diagnosis of some of the cases, we admit, but these, we think, will be filled in the future. Dr. Smith's hypothesis, on the other hand, is nearly all gap and very little substance.

It is constantly necessary to point out to newly arrived resident medical officers in this hospital, that there is no single sign pathognomonic of lead poisoning and that in doubtful cases the evidence must be weighed for and against. Dr. S. A. Smith does not appear to have grasped this fact, for he claims that the weight of evidence is not sufficient to diagnose plumbism, but he apparently fails to see that the weight of evidence in favour of anything else is almost negligible.

Dr. Smith may know of a pathognomonic sign of plumbism, but he has not told us of it.

We should like to add that a bacteriological examination of the cerebro-spinal fluid is always made when a lumbar puncture is done and that blood examination is a routine procedure in these cases, but nothing has ever been found except anæmia and basophilia, which is almost constant.

Dr. Smith's attitude is nothing new to us. Nearly everybody, on first hearing of these cases, adopts the same, but after a short experience of them becomes converted. The difference in Dr. Smith's case is that, although he has never seen the cases, his evidence is being used to block the long-sought preventive legislation which we hope is nearing realization.

Yours, etc.,

GIFFORD CROLL
G. P. DIXON
ARTHUR V. MEEHAN
WALTER CROSSE
E. O. MARKS
A. T. NISBET
A. C. WARD
NEVILLE G. SUTTON
DONALD A. CAMERON
J. J. POWER
S. F. McDONALD
T. H. R. MATHEWSON
A. G. BUTLER

Members of the Board.

Hospital for Sick Children, Brisbane,
March 20, 1922.

PRESENTATION TO EMERITUS PROFESSOR SIR J. HALLIDAY CROOM.

SIR: It is proposed to present to Sir Halliday Croom, who retires after fifty years of teaching in the Edinburgh School, "some tangible token of affection and appreciation by his former assistants and residents." I quote these words from the circular issued by the Edinburgh committee. The Secretary of the movement is Dr. Douglas Miller, 50, Northumberland Street, Edinburgh, and he has re-

quested me to insert an intimation in THE MEDICAL JOURNAL OF AUSTRALIA.

It is intended to entertain the Professor at a complimentary dinner and on that occasion present him with the testimonial (actual form not yet decided).

This distinguished and honoured teacher is a living memory to all Australians who have come under his influence and any who wish to join the movement should communicate with the Secretary.

I should myself be glad to send a copy of the full circular to any colleague who may desire it.

Yours, etc.,

A. WATSON MUNRO, M.D.

175, Macquarie Street, Sydney,

March 14, 1922.

THE PROPHYLAXIS OF VENEREAL DISEASE.

SIR: The question has been raised respecting the official attitude of the British Medical Association¹ to this problem. The attitude of the profession is definite and was expressed by the following resolutions carried at the full meeting of the Brisbane Congress in 1920. They were adopted by the Congress on the recommendation of the Section of Obstetrics and Gynaecology.

1. That a very large proportion of the so-called diseases peculiar to women are primarily caused by gonorrhoea.

2. That a considerable number of deaths, as well as much suffering, chronic invalidism and sterility result.

3. That large numbers of children lose their sight from the same disease.

4. That great expense is incurred in treatment, both by individuals and by the public.

5. That the best way to combat this menace to the women of Australia is to try to prevent those who have exposed themselves to infection from contracting the disease.

That the Federal and State Governments be urged to take such steps as will make the most up-to-date methods of prophylaxis against venereal disease as widely known as possible and also to make such measures available where possible.

That this and the foregoing statement be forwarded to the Prime Minister and the Premiers of the various States.

It is, of course, open to individual members to disagree with this resolution, but nevertheless it expresses the proper official attitude of the profession.

May I briefly summarize the present controversy on the subject? In all probability more than half of the sufferers of venereal diseases are not responsible for its acquisition and consequently the *lex talionis* cannot be applied. What can we do to minimize the wholesale destruction is carried on?

Shortly, there are three methods:

1. If sex relationships are confined to marriage, there is no doubt that venereal diseases would disappear. Such an ideal is a great one, but requires for success the most profound alteration in education, social valuations and many basic human qualities. What are the chances of effecting the enormous changes required in any reasonable period of time and what steps are being taken to effect these changes?

2. All people who become infected, must be efficiently treated, probably under compulsion in many instances; the treatment in many cases will last throughout life. What machinery can be devised for undertaking so colossal a programme and what would it cost?

3. Instruction may be given to the public respecting the nature, treatment and mode of prevention of venereal diseases. Instruction may be given in detail to people who desire it in methods of prophylaxis by medical practitioners, methods which have proved very efficient in the army where thoroughly applied.

¹ Sir James Barrett presumably refers to the Australian Branches of the British Medical Association.

My own view is that all three lines of attack should be utilized. A section of people, however, object to the third proposal on the ground that it will induce immorality by producing safety. To me the right policy is to state the whole case broadly, but not in medical detail, to mixed audiences and to ask citizens to think the matter out for themselves. If they want technical details, they can consult their own medical practitioners. The objectors, however, tell me that the knowledge that there is such a think as prophylaxis must be concealed from the people in their moral interest. The suppression of facts and the denial of the right of individual judgement in matters of conscience seems to me to be indefensible and I cannot find any justification for the view that bishop or doctor is entitled to lay down the law in matters of conduct for other persons. He is entitled to express his own view after stating the facts. I fancy that most medical practitioners will not sympathize with a movement which has as its basis the suppression of the truth and the denial of the right of individual judgement.

Yours, etc.,

JAMES W. BARRETT.

SIR: Dr. Richard Jones, of Melbourne, asked two questions in a letter to THE MEDICAL JOURNAL OF AUSTRALIA of March 18, 1922, regarding the moral aspects of venereal prophylaxis.

The first question was as to whether or not venereal prophylaxis would play any part in the prevention of pregnancy. It would. The condom, if correctly used and of good quality, would prevent semen as well as any possible infection from coming in contact with the female parts. The douche, if used directly, as advised, would prevent conception in a large number, but not all, of the cases.

Would it enhance the desire for sexual intercourse? Hardly! I do not see where the routine of prophylaxis could have any effect on sexual desire. I believe, though, that sexual intercourse would increase a little if safety from venereal diseases could be almost guaranteed. Many men and women have strong sexual desires which are held in check, not on account of any moral scruples, but by fear of infection or of conception.

The problem put to the medical profession is to find a way to reduce the incidence of venereal disease. The moral side of the question holds but a minor part in the problem at present. Later, when the venereal question has been satisfactorily dealt with, the moral aspect can be approached, if necessary, by the Church and the medical profession combined.

I admit that any manipulations or contrivances which may affect the birth-rate are of serious importance to a young country, but the health of a country comes first always—even before its morals—and on that point alone I am personally in favour of venereal prophylaxis, in spite of any part which it may play in the prevention of pregnancy. Yours, etc.,

J. COOPER BOOTH.

Moffitt Chambers, 283, Elizabeth Street,
Sydney, March 20, 1922.

HYDATID DISEASE.

SIR: Just after reading the address of the retiring President of the Victorian Branch of the British Medical Association, Dr. Basil Kilvington, I was consulted by a patient with an abdominal swelling which had taken about two years to attain the size it then was and which gave the woman no subjective symptoms until two months before she consulted me. The symptom complained of was a "dragging pain" which was constantly present and especially troublesome after stooping, the situation being the right hypochondriac and umbilical regions. She had an operation for abdominal hydatids about three years ago.

On physical examination a tumour was demonstrable, extending from the right hypochondriac region downwards and across the mid-line for three fingers' breadth from the left anterior superior iliac spine, the most prominent part

of the swelling being an inch and a half to the left of the umbilicus. It was freely movable laterally and dull on percussion, such dullness being continuous with liver dullness. Percussion caused some pain at the right costal margin; otherwise there was no tenderness. No thrill could be elicited. A provisional diagnosis of hepatic hydatid was made and laparotomy advised. The patient consenting, this was done on January 19, 1922.

The abdominal wound was made over the most prominent part of the swelling, as advised by Dr. Kilvington, and a sac quite free of adhesions was delivered through the wound. The margins of the latter were then well protected and a medium-sized trocar and cannula were inserted into the cyst wall. No fluid was obtained, but on pressure a creamy substance oozed through the cannula, which was then removed and the edges of the opening it made firmly grasped with tissue forceps. The sac was then opened for about five inches. The next step was to scoop out the contents with a tablespoon. The contents measured something in the neighbourhood of a quart. This being done, the interior of the sac was flushed with sterile water, mopped dry and two and one-half ounces of 10% formalin solution were injected. The adventitia was then closed with a single layer of No. 4 catgut and the abdomen closed layer by layer.

The patient made an uneventful recovery, refusing morphia, as she said she was not in any severe pain. She left hospital three weeks after the operation, at which Dr. H. Furnell assisted and Dr. C. Sutton gave the anæsthetic.

Yours, etc.,

J. AMESS TROUP, M.B., B.S. (MELB.).

North Melbourne, February 27, 1922.

THE DOCTOR'S NAME PLATE.

SIR: Your leading article *re* "The Doctor's Name Plate" and the discussion of the Federal Committee of the British Medical Association on Australia remind me very forcibly of a description once applied to our mother country by the newly-appointed Agent-General for Queensland.

We are constantly being reminded of the honour and dignity of our profession, which should indeed be worthy of such terms, but the continual reference to the vileness of advertising by medical practitioners by those high up in the ranks of the profession, to my mind, sadly lacks both honour and dignity. Why do I say this?

Because, during my brief period as a medical practitioner, some seventeen years approximately, it has been more and more forced on my conviction that the policy of self-advertisement in the medical profession is being more and more resorted to and countenanced by the British Medical Association. How can I support this opinion? In pre-auto. days the doctor's groom wore a livery. This being nothing less than flagrant advertising, unconscious, perhaps, on the part of some. In England at least the very dress of the medical practitioner was a dress dictated by medical fashion, *i.e.*, an advertisement. In what other ways do medical men advertise to-day? They are legion; I mention a few. The British Medical Association forbids signed articles by medical men on medical subjects in the lay press, on the grounds that it is form of advertising, but a medical man may get on a public platform, show himself and have his wise and wonderful knowledge published far and wide as emanating from his learned mind. Nowadays a medical man must drive a fine-looking car (if he can). Is there any reason to ask "Why?" Are there no medical men who advertise in their daily conversation? Are there no medical men who join clubs, sporting associations, etc., "because they have"? *i.e.*, they must advertise themselves. Do we read scientific papers at our British Medical Association from purely altruistic motives? Many do, but many do not.

Sir, these things are unavoidable; they happen; no association of medical men can stop them; it is only human nature; but for Heaven's sake let us cut out this "cant, humbug and hypocrisy." Forsooth, I may not put the indication of my specialty on my name plate. You say the matter of a dentist's name plate is a matter that concerns dentists, not doctors. Surely any medical man will recognize that modern dentistry is merely a part of the

great science of medicine, as is rhinology. "What's in a name?"

Let us be honourable in our dealings with one another and with the public. Whilst we are smugly obsessed with this idea of our wonderful honour and dignity, let us have more genuine honesty and straightforwardness in our professional conduct.

Would that I were a caricaturist; what a sight! Our honourable and dignified members of the Federal Committee harassing their learned brains to decide the question whether a poor aspiring young specialist may be permitted to inform the great public that he is perhaps one who might be able to help them in some of their difficulties.

In conclusion, may I cite the advice once given to me by a prominent surgeon and a member of the Council of one of the Branches of the British Medical Association? The advice was to attend all meetings of the British Medical Association, take a prominent part in discussions, whether one had anything worth saying or not, make one's self heard and keep on doing so. Yours, etc.,

ERNEST CULPIN.

Wickham Terrace, Brisbane,
March 18, 1922.

SPONTANEOUS RUPTURE OF THE HEART.

SIR: The interesting report of a case of spontaneous rupture of the heart by Dr. G. A. Birnie in THE MEDICAL JOURNAL OF AUSTRALIA, January 21, 1922, prompts me to record a similar instance of this rather rare occurrence.

Mrs. P.B., *atatis* 64, a thin, frail woman, was admitted to hospital at 7.15 p.m. and died in twenty minutes. In the morning she had complained of severe pain over the left breast, radiating through to the back. The pain became agonizing, especially on movement. On arrival at hospital the pulse was noted to be of good tension, the heart sounds distinct, but irregular, the apex beat palpable. Respirations were forty per minute. The face showed greyish pallor, not specially anxious. In the ward she was very fearful of movement on account of the pain. The pulse was 88, feeble and soft. The heart sounds were clear and loud. Crepitations were heard at the lung bases. The face and extremities were cold. Death came suddenly.

Post mortem, the pericardium was full of dark blood and the coronary arteries were of the "pipe-stem" type, with occlusion of the inter-ventricular branch of the left coronary artery. There was a ragged tear 1.25 centimetres (half inch) long in the left ventricle, 3.7 centimetres (one and a half inches) from the thrombus. The heart muscle was very flabby and fatty and there was extensive atheroma of the aorta. The lungs were emphysematous and oedematous. The liver was a little fatty. The kidneys were in good condition.

This case presents many of the same features as the one reported by Dr. Birnie and in both the rupture was due to occlusion of a branch of an atheromatous coronary artery, associated with nutritional fatty and fibrous changes in the ventricle muscle. The symptom-complex of agonizing præcordial pain in elderly people, fear of movement, anxiety, shock and rapid death is scarcely sufficient for a confident diagnosis *ante mortem*. It would be interesting to know the frequency of this condition from the pathological records of our large hospitals and from coroners' inquests. Yours, etc.,

M. D. SILBERBERG.

14, Collins Street, Melbourne,
February 7, 1922.

NEGLECTED CHILDREN'S DEPÔT, ROYAL PARK.

THE services of a medical practitioner with experience in children's diseases to act as the Medical Officer and Superintendent of the Neglected Children's Depôt, Royal Park, Victoria, are being sought. The Public Service Commissioner announces that reasonable facilities will be provided to enable the medical officer to undertake clinical practice at the recognized general hospital in Melbourne. An advertisement of this vacancy appears in another part of this issue.

Naval and Military.

APPOINTMENTS.

THE following information has been published in the *Commonwealth of Australia Gazette*, Nos. 20, 24 and 26, of March 9, 16 and 23, 1922, respectively:

Permanent Naval Forces of the Commonwealth.

SEA-GOING FORCES.

Confirmation in Rank.

SURGEON LIEUTENANTS (on probation) WILLIAM JAMES CONNOLLY, L.R.C.P., L.R.C.S., and JAMES MANN HENDERSON, M.B., Ch.B., M.C., are confirmed in the rank of Surgeon Lieutenant, with seniority in rank of 1st July, 1919, and 15th February, 1920, respectively.

Citizen Naval Forces of the Commonwealth.

ROYAL AUSTRALIAN NAVAL RESERVE.

Appointments.

SURGEON LIEUTENANT HAROLD HENRY FIELD-MARTELL is appointed District Naval Medical Officer, Fremantle, dated 6th September, 1921.

GEORGE WILLIAM MASON is appointed Surgeon Lieutenant (on probation) and as Sub-District Naval Medical Officer, Townsville, dated 27th October, 1921.

Promotion.

SURGEON LIEUTENANT-COMMANDER (RETIRED LIST) WILLIAM ARTHUR JAMES to be promoted to the rank of Surgeon Commander (Retired List), dated 24th January, 1922.

Termination of Appointment as District Naval Medical Officer and Transfer to Retired List.

THE appointment of SURGEON COMMANDER DAVID ERNEST WILLIAMS as District Naval Medical Officer, Fremantle, is terminated and he is transferred to the Retired List, dated 5th September, 1921.

Australian Military Forces.

FIRST MILITARY DISTRICT.

Australian Army Medical Corps.

HONORARY CAPTAIN H. L. GARDE is transferred to the Reserve of Officers, 1st March, 1922.

LIEUTENANT (provisionally) I. V. YOFFA is transferred to the Australian Army Medical Corps, Fourth Military District, 1st January, 1922.

Reserve of Officers.

THE resignation of CAPTAIN E. D. AHEARN of his commission is accepted, 13th February, 1922.

THE resignation of HONORARY CAPTAIN J. C. HEMSLEY of his commission is accepted, 17th December, 1921.

MAJOR R. F. CRAIG, D.S.O., and HONORARY CAPTAIN A. H. MELVILLE are transferred from the Reserve of Officers, Third Military District, 1st March, 1922.

THE date of transfer of HONORARY CAPTAIN G. W. SMITHWICK from the Reserve of Officers, Third Military District, notified in Executive Minute No. 60/1922, promulgated in *Commonwealth of Australia Gazette*, No. 17, dated 2nd March, 1922, is amended to read 27th January, 1922.

THE names of the undermentioned officers are removed from the Reserve of Officers, under the provisions of Australian Military Regulation 159, 3rd March, 1922: HONORARY MAJOR R. A. MEEK, CAPTAINS L. M. PIGOTT, A. J. REYE, T. LECKIE and L. P. WINTERBOTHAM, HONORARY CAPTAINS P. J. KELLY, J. A. E. A. LAVERY, J. J. LUDDY, A. W. G. MURRAY, A. J. S. C. ROBERTS, J. L. SELWOOD, J. M. THOMSON, A. C. WARD and C. E. WILLIAMS.

Retired List.

THE name of HONORARY COLONEL J. AHEARNE, V.D., is removed from the Retired List, under the provisions of Australian Military Regulation 159, 3rd March, 1922.

SECOND MILITARY DISTRICT.

Australian Army Medical Corps.

CAPTAIN AND BREVET-MAJOR J. B. F. MCKENZIE is transferred to the Reserve of Officers and to be Major, 1st March, 1922.

THE resignation of LIEUTENANT N. E. GOLDSWORTHY of his provisional appointment is accepted, 28th February, 1922.

LIEUTENANT-COLONEL (provisionally) R. DICK is transferred from the command of the Second Field Ambulance and is appointed to command the Ninth Field Ambulance, 1st January, 1922.

COLONEL J. A. DICK, V.D., C.M.G., relinquishes the command of the Ninth Field Ambulance, 31st December, 1921, and is transferred to the Unattached List, 1st January, 1922.

CAPTAIN (provisionally) D. T. SMITH is transferred to the Reserve of Officers and to be Honorary Captain, 1st March, 1922.

Reserve of Officers.

To be Major—HONORARY CAPTAIN GERALD BAYLEY CARTER, 1st March, 1922.

HONORARY CAPTAIN J. E. F. DEAKIN is transferred from the Reserve of Officers, 5th Military District, 1st March, 1922.

HONORARY CAPTAINS F. W. A. PONSFORD and JOHN CHARLES ROSS are transferred from the Reserve of Officers, Third Military District, 1st March, 1922.

THE resignation of CAPTAIN I. C. HAINS of his commission is accepted, 15th February, 1922.

THIRD MILITARY DISTRICT.

Reserve of Officers.

THE resignations of CAPTAIN W. J. FORSHAW, HONORARY CAPTAINS N. T. BULL, L. DOYLE, F. H. COLE and T. C. KER of their commissions are accepted, 14th February, 1922.

To be Captain—LIONEL JOHN HOOD, 12th December, 1921.

MAJOR R. F. CRAIG, D.S.O., and HONORARY CAPTAIN A. H. MELVILLE are transferred to the Reserve of Officers, First Military District, 1st March, 1922.

HONORARY CAPTAINS F. W. A. PONSFORD and JOHN CHARLES ROSS are transferred to the Reserve of Officers, Second Military District, 1st March, 1922.

CAPTAIN W. H. JERMYN is transferred to the Reserve of Officers, Fourth Military District, 1st February, 1922.

FOURTH MILITARY DISTRICT.

Australian Army Medical Corps.

THE provisional appointments of LIEUTENANTS R. M. GLYNN and L. A. WILSON are cancelled under the provisions of Section 16 of the *Defence Act* and Australian Military Regulation 158 (a), 16th February, 1922.

LIEUTENANT (provisionally) I. V. YOFFA is transferred from the Australian Army Medical Corps, First Military District, with corps seniority as from date of transfer, 1st January, 1922.

CAPTAIN H. A. WYLLIE, M.C., is transferred to the Reserve of Officers and to be Major, 10th March, 1922.

Reserve of Officers.

CAPTAIN W. H. JERMYN is transferred from the Reserve of Officers, Third Military District, 1st February, 1922.

FIFTH MILITARY DISTRICT.

Australian Army Medical Corps.

To be Captain, provisionally—LESLIE SAMUEL WOODS, 1st March, 1922.

To be Lieutenant, provisionally—LINDSAY GORDON MALE, 1st March, 1922.

CAPTAIN H. B. GILL is transferred to the Reserve of Officers, 1st March, 1922.

HONORARY CAPTAIN J. E. F. DEAKIN is transferred to the Reserve of Officers, Second Military District, 1st March, 1922.

SIXTH MILITARY DISTRICT.

Australian Army Medical Corps.

HONORARY CAPTAINS G. M. ANDERSON and G. J. D. DAVIES are transferred to the Reserve of Officers, 1st March, 1922.

Reserve of Officers.

THE temporary rank of Honorary Major granted to HONORARY CAPTAIN D. D. PATON is terminated, 31st December, 1919.

THE temporary rank of Honorary Captain granted to HONORARY LIEUTENANTS G. C. D. FORSTER, C. O. TEBBUTT and A. J. HERMAN is terminated, 31st December, 1919.

GRANT OF SUBSTANTIVE RANK OF THE RESERVE OF OFFICERS.

The Governor-General in Council has approved of the undermentioned officers being granted substantive rank on the Reserve of Officers equivalent to that held by them in the Australian Imperial Force or the Australian Naval and Military Expeditionary Force, as the case may be, at the date of the signing of the Armistice, dated 1st January, 1921, except where otherwise stated:

FIRST MILITARY DISTRICT.

To be Lieutenant-Colonels—HONORARY LIEUTENANT-COLONELS HAROLD BAILY FOLLITT and DONALD ALLAN CAMERON, Reserve of Officers.

To be Majors—CAPTAIN (HONORARY MAJOR) STUART KAY and HONORARY MAJOR AINSLIE STALHAM CLOWES, Australian Army Medical Corps Reserve.

To be Captains—HONORARY CAPTAINS EUSTACE RUSSELL, JAMES KING PATRICK, THOMAS OSWALD CHENOWETH, ANDREW BUCHANAN STEELE and FERGUSON AUGUSTUS LEMON, Australian Army Medical Corps Reserve. HONORARY CAPTAIN ROBERT HARVEY LEEDS, Australian Army Medical Corps Reserve, 17th December, 1921.

REFERRING to the notification respecting the grant of the substantive rank of Major on the Reserve of Officers to HONORARY CAPTAIN EDWARD ELMSLIE BROWN, Australian Army Medical Corps Reserve, which appeared in Executive Minute No. 367/1921, promulgated in *Commonwealth of Australia Gazette*, No. 70, dated 8th September, 1921, the Military District of this officer to be as now stated, and not as shown therein.

THIRD MILITARY DISTRICT.

To be Lieutenant-Colonels—HONORARY LIEUTENANT-COLONELS RICHARD RAWDON STAWELL, WILLIAM PERRIN NORRIS and STANLEY SEYMOUR ARGYLE and HONORARY MAJOR FRANCIS HENRY LANGLANDS, Australian Army Medical Corps Reserve; and HONORARY LIEUTENANT-COLONEL JOHN GORDON, C.M.G., Reserve of Officers.

To be Majors—HONORARY MAJORS LESLIE SCOTT LATHAM, HORACE PERN, Australian Army Medical Corps Reserve, and ARTHUR EDWARD MORRIS, HENRY NEWARK FEATONBY, ROBERT GEORGE MCPHEE and JOHN CANUTE GORDON GLASSFORD, M.C., Reserve of Officers.

To be Captains—HONORARY CAPTAINS CYRIL CHECCHI, EDWARD REAY MACKAY, JOHN HENRY MCGEE, NORMAN JOHN MACKAY, M.C., SAMUEL PERCIVAL LITTLE, ALFRED ERNEST DERAVIN, PERCY NEWALL WHITEHEAD, ROBERT LESLIE FORSYTH, WALTER HERBERT JERMYN, JOHN ELDER BUTCHART, ROY LINDSAY PARK, ALBERT OSCAR VINCENT TYMMS and GORDON OCHILTREE ROBERTSON, Australian Army Medical Corps Reserve.

FIFTH MILITARY DISTRICT.

To be Majors—HONORARY MAJOR ALEXANDER GOLDSTEIN, Reserve of Officers; and HONORARY CAPTAIN CHARLES NAPIER FINN, O.B.E., Australian Army Medical Corps Reserve.

SIXTH MILITARY DISTRICT.

To be Major—HONORARY CAPTAIN EDWIN MARSTON ALLESTER, Australian Army Medical Corps Reserve.

AUSTRALASIAN MEDICAL CONGRESS (BRITISH MEDICAL ASSOCIATION).

THE date of the First Session of the Australasian Medical Congress (British Medical Association) has been altered from February 12 to 17, 1923, to November 12 to 17, 1923. It will be remembered that the Federal Committee of the British Medical Association in Australia at its last meeting fixed the former date, but it was felt, even at that time, that the meteorological conditions in Melbourne in February were not usually propitious. The altered date will probably suit the convenience of the majority of members desiring to attend the First Session of Congress.

Books Received.

- THE CLINICAL EXAMINATION OF SURGICAL CASES: A HANDBOOK FOR THE USE OF STUDENTS AND PRACTITIONERS, by J. Renfrew White, M.B., F.R.C.S. (Eng.); 1922. Dureidin, New Zealand: J. Wilkie & Company, Limited; Post 8vo., pp. 129, interleaved.
- THE GLANDS REGULATING PERSONALITY, by Louis Berman, M.D.; 1921. London: Macmillan & Company, Limited; New York: The Macmillan Company; Demy 8vo., pp. 300. Price: 18s. net.
- THE VENEREAL CLINIC, by Several Writers; Edited by Ernest R. T. Clarkson, M.A. (Cantab.), M.R.C.S., L.R.C.P., with an Introduction by Sir Squire Sprigge, M.D.; 1922. London: John Bale, Sons & Danielsson, Limited; Demy 8vo., pp. 477, with eleven coloured and nine other plates. Price: 25s. net.
- FUNCTIONAL NERVOUS DISORDERS: THEIR CLASSIFICATION AND TREATMENT, by Donald E. Core, M.D. (Manc.), M.R.C.P.; 1922. Bristol: John Wright & Sons, Limited; Royal 8vo., pp. 371. Price: 25s. net.

Medical Appointments.

Dr. S. A. SMITH (B.M.A.) has been appointed temporarily as a member of the Police Medical Board for the purposes of the *Police Regulation (Superannuation) Act, 1906*, of New South Wales.

Dr. L. J. C. MITCHELL (B.M.A.) has been appointed to the position of Ophthalmologist to the Melbourne Hospital, *vice* Sir J. W. BARRETT, K.C.B., C.B., C.M.G. (B.M.A.), resigned.

Dr. J. E. NIHILL (B.M.A.) has been appointed a Member of the Dental Board of Victoria.

THE undermentioned have been appointed Public Vaccinators in Victoria: Dr. E. E. WEBSTER (B.M.A.) at Brighton, Dr. P. G. CLARKE at Ballan, Dr. W. J. FLANAGAN (B.M.A.) at Donald.

Dr. A. A. CROOKS (B.M.A.) has been appointed a Justice of the Peace for the Williams Magisterial District, Western Australia.

Dr. P. E. VOSS, M.C. (B.M.A.), has been appointed Government Medical Officer at Rockhampton and Health Officer for the purposes of *The Health Acts, 1900 to 1917*, of Queensland.

THE undermentioned have been appointed Quarantine Officers in the Commonwealth Government Service: Dr. D. G. ROBERTSON (B.M.A.), Dr. A. RICHARDSON, Dr. L. P. BRENT (B.M.A.).

Dr. R. L. E. WALMSLEY (B.M.A.) has been appointed Certifying Surgeon in terms of the *Workmen's Compensation Act, 1916*, within the County of Yancowinna, New South Wales.

Dr. R. S. ROGERS (B.M.A.) and Dr. H. J. PENNY (B.M.A.) have been appointed Superintendent and Deputy Superintendent respectively of the Enfield Receiving House, South Australia.

Corrigendum.

THE announcement of the appointment of Dr. J. LOCKHART GIBSON as a Trustee of the Boys' Grammar School, published on page 312 of THE MEDICAL JOURNAL OF AUSTRALIA of March 18, 1922, should read "at Brisbane" instead of "at Rockhampton."

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii.

DEPARTMENT OF PUBLIC INSTRUCTION, VICTORIA: Medical Officer.

MACKAY DISTRICT HOSPITAL, NORTH QUEENSLAND: Resident Surgeon.

NEGLECTED CHILDREN'S DEPÔT, ROYAL PARK, VICTORIA: Medical Officer and Superintendent.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmain United Friendly Societies' Dis- pensary Friendly Society Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phoenix Mutual Provident Society
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Pro- prietary, Limited Manchester Unity Independent Order of Oddfellows Mutual National Provident Club National Provident Association
QUEENSLAND: Hon- orary Secretary, B. M. A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Insti- tute Hampton District Hospital Stannary Hills Hospital
SOUTH AUSTRALIA: Honorary Secretary, 3, North Terrace, Adelaide	Contract Practice Appointments at Ren- mark Contract Practice Appointments in South Australia
WESTERN AUS- TRALIA: Honorary Secretary, 6, Bank of New South Wales Chambers, St. George's Terrace, Perth	All Contract Practice Appointments in Western Australia
NEW ZEALAND (WELLINGTON DIVI- SION): Honorary Secretary, Wellin- gton	Friendly Society Lodges, Wellington, New Zealand

Diary for the Month.

- APR. 4.—New South Wales Branch, B.M.A.: Council.
APR. 5.—Victorian Branch, B.M.A.: Branch.
APR. 7.—Queensland Branch, B.M.A.: Branch.
APR. 11.—New South Wales Branch, B.M.A.: Ethics Committee.
APR. 12.—Western Australian Branch, B.M.A.: Council.
APR. 12.—Melbourne Pædiatric Society.
APR. 13.—Victorian Branch, B.M.A.: Council.
APR. 13.—Brisbane Hospital Clinical Society: Meeting.
APR. 14.—Queensland Branch, B.M.A.: Council.
APR. 14.—South Australian Branch, B.M.A.: Council.
APR. 15.—Northern Suburbs Medical Association, New South
Wales.
APR. 18.—New South Wales Branch, B.M.A.: Executive and
Finance Committee.
APR. 19.—Western Australian Branch, B.M.A.: Branch.
APR. 21.—Eastern Suburbs Medical Association, New South
Wales.
APR. 21.—Western Medical Association, Cowra, New South
Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, B.M.A. Building, 30-34, Elizabeth Street, Sydney. (Telephone: B. 4635.)